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THIS WEEK'S National Petroleum NEWS

Coming Meetings

1933

American Petroleum Institute Division of Production, Southwestern division, Rice Hotel, Houston, April 7, 8.

Petroleum Industry Electrical Association, Tulsa, April 13, 14, 15.

Oil Equipment and Engineering Exposition, Texas State Fair Ground, Dallas, Tex., April 17 to 23.

National Petroleum Association, Cleveland Hotel, Cleveland, O., April 20, 21.

Natural Gasoline Association of America, Hotel Tulsa, Tulsa, Okla., May 15, 16, 17.

American Petroleum Institute, mid-year meeting, Mayo Hotel, Tulsa, Okla., May 17, 18, 19.

Virginia Oil Men's Association, Patrick Henry Hotel, Roanoke, Va., May 18, 19.

Fire and Safety Marshals, National Petroleum Association, Bradford, Pa., June, 2, 3.

American Oil Burner Association, Stevens Hotel, Chicago, June 12 to 16.

American Society for Testing Materials, Stevens Hotel, Chicago, June 26 to 30.

National Petroleum Association, Traymore Hotel, Atlantic City, N. J., Sept. 20, 21, 22.

American Petroleum Institute, annual meeting, Chicago, Oct. 24, 25, 26.

NATIONAL PETROLEUM NEWS

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Your Capacity-Lubrication Chart Is Ready

DO YOU know the capacities and lubrication requirements of all cars driving into your stations today? The S. A. E. viscosity number of summer oil for the new Ford? The transmission capacity of the new Chevrolet? What models take free wheeling lubricant? Where is the oil fill pipe on the Cadillac V-8?

The 1933 Passenger Car Capacity Chart compiled from car manufacturers' data gives all this information. It is an accurate and handy reference for your service man and is printed on heavy cardboard, suitable for hanging on station or lubritorium wall.

Prices are: postpaid, 50c each up to 10; 40c each, from 11 to 20 copies; 37.5c each, 21 to 50; f.o.b. Cleveland, lots of 50, $15; lots of 75, $20; 100, $24. Prices are scaled down on larger quantities. Cash, money order or stamps must accompany small orders.

For further details, write: NATIONAL PETROLEUM NEWS, 1213 West Third St., Cleveland, O.

FRED T. MANLEY, vice-president of The Texas Co., like a vast number of other executives in the oil industry, is a native of Pennsylvania. He was born at Shinglehouse, and had his first refining experience at the Acme Oil Works, Olean, N. Y.

Since he joined The Texas Co. in 1902, Mr. Manley has been connected with both sales and manufacturing branches of the company, at one time having been sales manager in the southern division, with Houston headquarters.

Mr. Manley was joint patentee with R. C. Holmes, now Texaco's president, of the Holmes-Manley cracking process. He was made a vice-president in 1928 and placed in general charge of manufacturing.

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Federal Curb on Bootleg Crude Shipment Is Recommended by Roosevelt

By V. B. Guthrie
N. P. N. Managing Editor

By Telegraph

WASHINGTON, April 4

PRESIDENT ROOSEVELT April 3 announced the measures the national government will undertake to bring relief to the oil industry from the conditions which confront it today through the breakdown of state proration.

His recommendations were based on the program drawn last week by the Committee of Fifteen made up of representatives of the oil states governors and of the oil industry, and submitted to the President through Secretary of the Interior Ickes.

The President's specific proposals for relief, particularly emergency relief, were not what some in the industry who attended the Washington conferences had hoped. However, he pointed out, the federal authorities did not have the legal powers to take some of the action suggested and he recommended appropriate action by the oil state governors.

President Roosevelt, in transmitting to the governors of the 17 states represented at the Washington conferences, the conference recommendations, turned down the suggestion that he ask the governors to declare a moratorium on production in flush fields for a period of 15 days or such a matter. He said this was beyond federal authority.

The President said that he would recommend to Congress the passage of legislation prohibiting the movement in interstate commerce of "bootleg" or illegally produced oil. This was one of the principal recommendations of the recent Washington conference. On this point the President said:

"The Committee of Fifteen . . . recommend certain action on the part of the federal government. I am of the opinion that the suggestion that the Congress pass legislation prohibiting the transportation, in interstate commerce, of any oil or the products thereof produced or manufactured in any state in violation of the laws thereof, is well considered.

"I am prepared to recommend such legislation to Congress as a contribution on the part of the national government toward the solution of the difficulties in which the oil industry finds itself."

The proposed legislation will probably be in the nature of additional clauses to the interstate commerce act giving the Interstate Commerce Commission the specific authority to check the interstate movement of oil and its products by pipeline or rail.

The Interstate Commerce Act now declares that the movement of oil in pipelines comes within the jurisdiction of the act, but no definite mention has been made of the matters in relation to the operations of the pipelines over which the commission shall exercise jurisdiction, except those calling for filing of rates, reports and so on.

THIS proposed federal legislation, to be effective as far as stopping the movement of bootleg crude is concerned, depends on the co-operation of the oil producing states in setting forth the maximum amounts of crude which may be produced in their fields, in line with each state's conservation policy.

President Roosevelt also approved that part of the program of the Washington conference asking that federal authorities take definite steps to ferret out and prosecute evaders of payment of the Federal gasoline tax. Such evaders are also evaders of payment of the state

gasoline tax and their operations in the marketing of gasoline have been looked upon by the established oil companies as largely responsible for demoralized gasoline markets.

The suggestion in the relief program on this point is that the Bureau of Internal Revenue be instructed to ascertain the facts as to consignor, consignee, destination and quantity of all gasoline shipments from refineries and to transmit this information to the tax collecting authorities in the states in which the gasoline is moved.

Presumably this suggestion, to be effective, needs only an executive order from the President or Secretary of the Treasury and apparently it will make it much harder for gasoline to be shipped from refineries and sold to the public without payment of the tax. Prosecutions for evasion of the federal tax would force similar prosecutions by state authorities.

The federal gasoline tax law carries heavy penalties, of both fine and imprisonment, for evasion of payment in contrast to the light penalties in some of the state laws which light penalties have encouraged evasion of payment.

THE President, in his statement to the oil state governors, made no comment on one suggestion for emergency relief in the conference program, which had been interpreted by some as giving him dictatorial powers over the industry. This was that the President request of Congress certain temporary emergency powers. One such power was to permit him to cooperate with the authorities in the oil producing states in bringing about greater compliance on the part of the state authorities with the recommendations in the Washington program. The other was that he have power from Congress to co-operate with the oil industry in the carrying out of its portion of the Washington program. The suggestion was that this authority be effective only for the present emergency and terminated whenever, in the President's opinion, the emergency had ended.

By inference it may be taken he regarded such action as encroaching on the rights reserved for the individual state authorities.

In his letter to the governors President Roosevelt said that there are other recommendations which appear reasonable but which are not of immediate importance. On this point he said:

"There are other suggestions and recommendations made to the Secretary of the Interior as a result of the deliberations of the oil conference that on their face are fair and reasonable but which do not require immediate action. These recommendations can be taken up at a later date, perhaps after further conferences between the representatives of the states and of the industry and of the national government."

PRESIDENT ROOSEVELT, in his announced program of measures the federal government will undertake for the relief of the industry, took one suggestion from the small group of so-called insurgent independent operators who refused, at the Washington conference, to participate in the working out of a program by the representatives of the oil states governors and of the industry itself.

This was that Congress undertake to enact emergency legislation, "divorcing the oil pipelines engaged in interstate commerce from other branches of the industry." The President stated, "I am of the opinion that this is a reasonable request and that such legislation should be enacted at as early a date as possible."

The independents also suggested in their program submitted to Secretary of the Interior Ickes that the Interstate Commerce Commission be required to fix and enforce fair and reasonable rates by pipeline common carriers engaged in the transportation of petroleum in interstate commerce.

President Roosevelt did not comment on this suggestion. However, it was brought out in the Washington conferences that the large earnings reports of the pipeline companies in general indicated the oil companies owning them were crediting to themselves part of the price of crude at the well in the form of a high charge on transportation of the oil by pipeline and that, with a lower pipeline charge, a higher price for crude oil at the well might follow.

Just before the President gave out his letter to the oil state governors transmitting the report of the Washington conference, R. C. Holmes, president of The Texas Co., issued a copy of a message sent to the White House, to members of Congress and the governors of the oil producing states. He advocated a four-point program including:

1—Honest application and enforcement of state and federal gasoline tax laws on all alike, without exception.

2—Enforcement of conservation laws on all alike.

3—Enactment only of such legislation, state and federal, as is needed to assure the above measures being done as equitably to all interests as practical.

4—Setting up of such machinery, state and federal, as would provide for enforcement of this program.

Criticising the public statements made by the insurgent independents at and following the Washington conference, Mr. Holmes said:

"Are we going to allow a part of the press, with misinformation, or a lack of full information, and a few misinformed, misguided politicians to ruin the oil industry and perpetuate a scandal that makes the oil scandals of the Harding administration look like petty graft and larceny?"

J. B. ELLIOTT, California operator, chairman of the insurgent independents at the Washington conference, who called themselves the Independent Petroleum Association Opposed to Monopoly, in a public statement said:

"The old oil monopoly has been completely routed and plans to entrench itself in the Roosevelt administration have been signally frustrated. It is known that there will be no federal oil czar, no holiday shutdown of oil production, no dictation to the oil states in favor of the monopoly.

"Out of the rout is coming

(*Continued on page* 10)

THE EDITORS' VIEWPOINT

The President's Oil Industry Relief Program

PRESIDENT ROOSEVELT'S program for relief for the oil industry, among other things, contains definite recommendations for remedies for two conditions which the oil company heads have consistently maintained have been the source of most of the economic ills of the industry.

The President did not go as far as many oil men had hoped, through his failure to suggest to the governors of the oil producing states that they declare a moratorium on production in their flush fields for 15 days or such a matter.

On the other hand there were others who did not at any time, during the recent conferences in Washington, believe the President would take this step, in view both of the political considerations involved and our present recognition of the rights of the individual states to govern the development of a natural resource within their boundaries.

The oil company heads have said that the competition of bootleg, or illegally produced, crude and its products and the competition of gasoline on which the payment of the state and federal gasoline taxes had been evaded, were the principal cause of their troubles.

The President promises relief from both these conditions. For one, the evasion of payment of the gasoline taxes, the relief can be quickly brought about by an order to the Bureau of Internal Revenue, as is suggested, asking the bureau to require specific information from all refineries on all gasoline shipments. This information will be sent to the state tax authorities in the state into which the gasoline is shipped.

This co-ordination of information between federal and state authorities can quickly make the running down of tax evaders a simple matter. The penalties for evasion of payment of the federal gasoline tax are such that few will attempt it, with the knowledge that information on all shipments is in the hands of those authorities.

For relief from the volume of illegally produced crude oil and its products thrown on the market by the breaking down of the states' proration programs, the President has promised the form of permanent relief asked by the industry. That is the federal legislation prohibiting the pipelines—or railroads for that matter—from handling, in interstate commerce, crude produced in violation of the state laws.

As a matter of fact what President Roosevelt has announced as his program for relief for the oil industry includes a far wider federal supervision of oil pipeline operations than those in the industry contemplated when they suggested legislating against the handling of bootleg oil. The President has said he would ask Congress for legislation divorcing the pipelines from other branches of the oil industry.

This was a suggestion from the so-called insurgent independent operators at the Washington conference. Its adoption by the President, with the suggestion outlined in the preceding program, implies an attempt at bringing the operations of the oil pipelines pretty generally under some such federal supervision, through the Interstate Commerce Commission, as the railroads have. The regulation of pipeline rates would naturally follow.

THOSE who had high hopes of more immediate relief for the oil industry from Washington must remember that emergencies within industries are entirely relative with the new administration. Many industries are at Washington presenting their cases. In some of them—the railroads and banking notably—the degree of public interest and welfare is greater than in the emergency in the oil industry. It seems logical that these will receive the first attention of President Roosevelt and his aids.

The oil industry must bear in mind that the administration at Washington expects the industry itself to do what it can—and more than it has done—to set its own house in order. Given relief from the competition of bootleg crude and gasoline on which the tax has been evaded, the attitude of the administration will be for the oil industry to do some housecleaning of its own, toward the elimination of uneconomic marketing practices costly to the public.

The writer's mind runs back to another memorable conference in Washington, in 1929, when the industry took before the federal authorities a definite program for conservation activities the industry proposed itself to carry on. It was stopped cold because an attorney general said that perhaps what was proposed would be found in violation of anti-trust laws. Since that time the coal industry has secured U. S. Supreme Court approval of a more co-operative plan than anything the oil industry had in mind.

Not for a moment can the industry let up in its own constructive efforts because the President's program is not all that everyone had hoped.

Federal Curb

(*Continued from page* 8)

real legislation for the separation of oil pipelines, and perhaps service stations, from the production and refinery units, the enforcement of reasonable oil pipeline rates and regulations by the Interstate Commerce Commission and probably a congressional investigation of the big business monopoly in the petroleum industry that will make history."

Roosevelt Policy Will be Helpful To Oil Industry — C. B. Ames

By Teletype
NEW YORK, Apr. 4

EFFECTIVE carrying out of conclusions reached by President Roosevelt and sent to the governors of oil producing states will be of great help to the petroleum industry, C. B. Ames, president of The American Petroleum Institute, declared today in a formal statement. Mr. Ames expressed confidence that the governors will co-operate. His statement follows:

"The President, in his letter to the governors of the oil producing states, transmitting the recommendations made to the Secretary of the Interior as the result of the three-day conference held in Washington last week, has reached three conclusions which, if made effective, will be of great help to the petroleum industry.

"He states definitely that he is prepared to recommend to congress legislation prohibiting the transportation in interstate and foreign commerce of any oil or the products thereof produced or manufactured in any state in violation of the laws thereof. If Congress promptly adopts this suggestion it will be of enormous value in the East Texas pool.

"For several months great quantities of unlawfully produced oil have been moving out of that field by rail. The railroad commission has undertaken to stop it, but the subject was beyond its jurisdiction. The railroads themselves have expressed a desire to stop it, but have claimed that under Federal law they were compelled to receive this oil and transport it in interstate commerce, notwithstanding the fact that it was unlawfully produced.

"When Congress acts favorably on this recommendation of the President, therefore, the federal government, the states and 95 per cent of the industry will be united in the attack on the "hot" oil racket.

"There has been lack of co-operation between the Bureau of Internal Revenue and the tax collecting agencies of the states in connection with the gasoline tax. It has likewise been believed for some time that several of the smaller pipelines operating in the East Texas field have been evading the Federal pipeline tax.

"The action of the President in instructing the tax collecting agencies of the Government to co-operate with the states and with the law abiding elements in the industry in respect of the matters will be of great aid in the fight on gasoline tax evasion, and will, therefore, be helpful to the government, the states, and the industry.

"The third matter of great importance outlined by the President is his request to the governors to give special attention to those recommendations made by the Washington conference concerning matters beyond the jurisdiction of the President and in reference to which he expresses the hope that the governors of the states affected, after consultation with each other, will take appropriate action to meet the emergency. The conservation of our oil resources is a problem which entirely disregards the boundaries of any one state. In the absence of Federal control of production it is necessary, therefore, if we are to have a sound program, for the principal oil producing states to treat each other in a neighborly way and co-operate towards the accomplishment of the common purpose.

"If the governors of these states and their respective regulatory bodies comply with the President's request to co-operate, as they doubtless will, we can look forward with confidence to greater progress in the conservation movement."

Permanent Conference of Oil States Recommended

WASHINGTON, April 3

PLANS for continuing the work of the conference of representatives of governors of oil producing states, as a means of co-ordinating the oil conservation programs of the individual states, was announced by the group of representatives who met here March 27, on the call of Secretary of the Interior Ickes.

The representatives of 16 states present recommended to the governors the appointment of one or more from each state to meet in Washington as soon as possible and plan for a policy of continuous co-operation between the federal government and the state authorities.

They also urged an immediate personal conference between the governors of Oklahoma, Texas, California, Kansas and Louisiana, to which it was suggested, might be invited the governors of other oil producing states or their representatives, and the members of the conservation agencies in those states, for the purpose of co-ordinating action by these states.

The resolution of the governors' representatives also approved the action of its subcommittee in joining in the program of relief measures for the

oil industry which was adopted at Washington and presented to Secretary Ickes.

The 16 states and their representatives joining in the recommendations were:

Texas—C. C. McDonald, Wichita Falls; T. L. Wynn, Athens; D. J. Harrison, Houston.

California—Wm. H. Cooley, Bakersfield; Ralph B. Lloyd, Los Angeles.

Oklahoma—Col. Cicero I. Murray, Oklahoma City.

Kansas—Gov. Alfred M. Landon.

Louisiana—Scott Heywood, Jennings.

Wyoming—U. S. Senator John B. Kendrick; Joseph O'Mahoney, first assistant postmaster general.

Pennsylvania—Ralph T. Zook, Bradford.

New Mexico—J. D. Atwood, Roswell; Wm. J. Barker, Santa Fe; Albert T. Woods, Artesia.

Colorado—Warwick M. Downing, Denver.

Arkansas—John W. Olvey, Eldorado.

Montana—Thos. S. Hogan, Midland, Texas.

New York—David H. Newland, state geologist, Albany.

Ohio—I. C. Grimm, Woodsfield.

West Virginia—A. S. Heck, Spencer.

Illinois—State Senator R. M. Shaw, Lawrenceville.

Rhode Island—Louis D. Pierce, Providence.

Ills of Foreign Trade To Be Considered

PITTSBURGH, April 4.—The 20th national foreign trade convention will be held in Pittsburgh April 26, 27 and 28. Because of the problems now confronting the United States in international trade, this meeting is expected to attract leaders of all industries, including oil.

Joseph C. Trees, vice-president of Benedum-Trees Oil Co., Pittsburgh, will represent the oil industry on the general convention committee. James A. Farrell, formerly president of the U. S. Steel Corp., and chairman of the National Foreign Trade Council, is calling the meeting to study the problems of our foreign trade policy, particularly in view of the fact that our exports and imports diminished steadily the latter part of 1932.

Other subjects to come up for discussion are tariffs, war debts, depreciated currencies and trade barriers.

National Petroleum Association Meeting Program Announced

WASHINGTON, April 3 GENERAL economic and oil marketing and technical subjects are on the program of the 30th semi-annual meeting of the National Petroleum Association, to be held at Cleveland Hotel, Cleveland, ences will convene the day preceding the opening of the for- April 20 and 21. Group confermal program, according to an announcement from Fayette B. Dow, general counsel of the association.

At the general session the afternoon of the 20th, E. M. Lyons, Tiona Refining Co., Philadelphia, president of the National Petroleum Association, will present his address. L. V. Nicholas, oil marketing counselor, Chicago, will talk on, "The Cost of Meeting Competition as Tendered." John D. Gill, Atlantic Refining Co., Philadelphia, will talk on, "The Rules of the Game," and Paul J. Eakin, Cleveland analyst, on "A Study of American Business Depressions."

"Mr. Gill has been making a study of petroleum economics for a long time, which will be embodied in an important contribution to this subject," said Mr. Dow in announcing his program. "The discussion of American business depressions will bring out, possibly, some forecasts based on other depressions."

The general session the morning of April 21 will include papers on "Paraflow," by John A. Britton, Jr., of the Standard Oil Development Co.; "Yesterday and Today in American Aviation," by James G. Haizlip, Shell Petroleum Corp.; and "The Motor Octane Tests for Gasoline," by H. L. Horning, president Waukesha Motor Co., Waukesha, Wis. Mr. Horning has appeared on National Petroleum Association programs before to the instruction and entertainment of his audience. At this session also, W. T. Holliday, president Standard Oil Co. of Ohio, will discuss important industry problems.

Following the custom of previous years, the social event of the meeting, the Fellowship Supper, will be held April 20 at the Hermit Club.

There will be group conferences on fire prevention and safety and on gasoline the 19th and, the morning of the 20th, separate conferences on Pennsyvlania lubricating oils, Midcontinent lubricating oils, taxation of petroleum products and traffic and transportation.

Kentucky Jobber Killed At Rail Crossing

LOUISVILLE, Ky., April 1.—Herman Gill, proprietor of the Gill Oil Co., Owensboro, Ky., was killed with three of his service station operators March 25 when his car was struck by a train near Elizabethtown. One occupant of the car escaped with minor injuries.

Mr. Gill was driving on an unfamiliar road on his way from Louisville to Owensboro, the regular road being closed by high water. In addition to his Owensboro interests Mr. Gill was associated with N. A. Malin in the G & M Oil Co. at Central City.

Discount to Cash Customers

CLEVELAND, April 4.—Standard Oil Co. of Ohio advanced posted gasoline service station prices 1 cent a gallon March 30 and set up a discount of 1 cent a gallon on all cash sales, as well as an additional 1 cent to be refunded to contract commercial customers who pay cash at the stations. The refunds are to be paid at the end of each month.

Ordinary credit customers will pay the full posted price. Commercial credit customers under contract will be billed at the end of each month at 2 cents under the posted retail price.

Basis of Refinery Equipment Design Challenged by New Facts

By Paul Truesdell

WASHINGTON, March 29 NEW found facts of great importance in the designing of new refinery equipment and in remodeling old, were brought out in a series of papers presented before the Petroleum Division of the American Chemical Society here.

While great progress has been made, in recent years, in perfecting the mechanical features of refinery unit design, what has newly been learned, in substance, is that much of this design has been based on faulty theories, from a process standpoint.

The application of these new facts will play a great part in refinery construction and modernization work in the future.

Twelve papers developing these facts were presented in a symposium on "Physical Properties of Hydrocarbon Mixtures," which for interest and value to the oil industry has never been surpassed in the history of the Petroleum Division.

The technologists who took part in the discussion laid new bases for the design of stills, fractionating towers, furnaces, heat exchangers and other equipment used in the distillation of petroleum.

They pointed out errors and fallacies that have been found in the premises on which design of refining units has been based up to the present time and in the methods of calculation that have been used.

Raoult's Law, respected for more than half a century and used by chemists and engineers as the basis for the design of distillation and fractionating equipment, was kicked around in the meeting like the Volstead act in a wet congress. Raoult's law, be it remembered, has long been supposed to govern the vaporizing tendencies of hydrocarbon mixtures.

For instance: According to Raoult's law, the vaporizing tendency of a mixture, say of naphtha and gas oil, would be proportional to the amount of naphtha in the mixture; if more naphtha were added the vaporizing tendency would increase in direct ratio to the addition.

The studies of vapor pressure which were reported on at the Petroleum Division meetings here brought out that there are many departures in practice from this law. It is now facing repeal or at least drastic amendment.

Dr. W. H. Bahlke, Standard Oil Co. of Indiana, presided at the symposium. He was chairman of the committee appointed at the meeting of the Petroleum Division last fall to promote discussion on this subject and to arrange for suitable papers. Dr. George Granger Brown, University of Michigan, and L. M. Henderson, Atlantic Refining Co., were the other members of the committee.

Data which have been reported by Dr. Bahlke and his associates at various times were used by some of the technologists who took part, as the starting point for their studies.

Dr. Brown reported a method developed jointly by himself and those working with him at the University of Michigan, and by Dr. Warren K. Lewis and his co-workers, at Massachusetts Institute of Technology, whereby it is possible to eliminate to a large extent errors involved in the use of Raoult's law as applied to petroleum fractions.

Two new concepts for correlating the physical properties of petroleum were set forth in a paper by K. M. Watson and E. F. Nelson, Universal Oil Products Co., presented by Dr. Watson.

By the use of methods developed by these two, starting with no other data than the specific gravity and the Engler distillation, it is possible to approximate the molecular weight, critical temperature and pressure, specific heats of liquid vapor, heat of vaporization at atmospheric pressure, change of heat of vaporization with pressure and change of total heat content with pressure, for stocks of varying character and boiling ranges.

It was also brought out, at the meeting in Washington, that all present methods for determining the latent heat of vaporization of petroleum fractions are based entirely on the properties of pure compounds.

Results so obtained are not applicable with sufficient accuracy to the wide range of stocks, to handle which equipment must be designed today, it is pointed out, and errors in design of refining units frequently result.

LACK of a method suitable for figuring latent heat of real oils is regarded as increasingly serious because of the growing tendency toward the building of very large units. A small error in computation, it is pointed out, becomes enormous in these large units.

It is the opinion of some technologists that a considerable number of refinery units, in the near future, must be revamped to take advantage of the latest knowledge, or, where that is impracticable, they must be replaced with units of new design.

"Engineering design of refinery units, in many cases, has run ahead of process design," said Dr. Brown, and he went on to point out that, in some distillation units recently completed, large errors have been made in figuring heat transfer and vaporizing capacity.

In one large refining unit recently completed, serious operating difficulties were met. Study of the unit and its operations disclosed that, due to using an erroneous basis for computation in design, the unit was failing by 5,000,000 B.t.u. per hour to deliver the results expected.

Further study is now being given the methods for figuring latent heat and papers dealing with the problems concerned are looked for at the Chicago meeting of the Petroleum division to be held next September.

New Law Expected to End Kansas Tax Exemption Abuse May 1

WICHITA, Kans., April 1

THE merry life of the gasoline bootlegger and tax evader in Kansas is to be seriously hampered in the near future. Purchase of tax free motor fuel and trucking of motor fuels in and out of the state is about to be regulated. Two measures were passed recently by the Kansas legislature. These go into effect May 1.

The original purpose of sponsors of the tax bill was to lower the present 3-cent tax to 2 cents and eliminate all exemptions. This purpose was defeated by the farmers' organizations of the state, so that the tax remains at 3 cents a gallon and allows farmers their former exemptions though with several restricting provisions. Every person who is entitled to purchase tax free gasoline for non-road purposes must obtain a permit, price 25 cents. Application for such permits must be accompanied by a statement showing the proposed use of the fuel and the specific place of use.

Permits must be presented *each* time a purchase is made so that the serial number may be placed on the exemption statements or the statement will not be accepted from the distributor as legal claim for exemption. They must also be signed by the purchaser, not merely by the truck driver. These exemption statements will be in triplicate, the original being sent to the state oil inspector, the second retained by the distributor, and the third copy given to the purchaser who must, between the first and tenth day of the following month, send his copy to the oil inspector. Permits will be revoked where receipt of them by the inspector is not reasonably prompt.

Purchasers must report also how much gasoline they buy for use on highways.

W. E. Brown, attorney for Sinclair Refining Co., Kansas City, Mo., speaking before the Kansas Oil Men's Association recently at Wichita, stated that tax exempt gasoline was at this time making up nearly 35 per cent of the total sales reported. He indicated that the misuse of exemption privileges was responsible and that the volume should not be over 12 per cent.

By close checking of the exemption statements the tax department will be able to trace irregularities and to restrict the issuance of permits to purchase gasoline tax free.

Another check on tax exempt sales is provided by limiting the purchases to the county in which the individual permit is issued or to those counties immediately adjoining. A minimum purchase of exempted fuels is placed at 40 gallons.

Unless given special permission by the oil inspector, gasoline may neither be received nor unloaded by a distributor between the hours of 9 p.m. and 5 a.m. This provision is aimed at bootleggers.

Every distributor must have a license which is to be issued by the state oil inspector. He must also file a bond of not less than $1000, sureties to be approved by the inspector.

The old tax law allowed 3 per cent for shrinkage and losses but the new law reduces this exemption to 2 per cent.

Distributors are allowed a delinquency period of but 10 days before their license is subject to suspension and an additional 10 days behind in payments brings a license revocation.

Delinquent taxes beyond the 10-day limit as fixed by the law are to be considered grounds for seizure and sale of property of the distributor for the amount of the tax.

The trucking regulatory act provides that the vehicle transportation of fuel in lots exceeding 120 gallons requires a liquid fuel carrier's license.

These licenses are not transferable, must show the name and address of the owner, and be numbered and dated. Applications must be accompanied by surety bond of not less than $1000 and each vehicle must be covered by liability insurance.

Permits to haul motor fuels are to be issued only to licensed distributors or to persons desiring to retail for them when their vehicles meet the specifications. Retailing gasoline on which the tax has been paid from such a truck is permitted only within a 25-mile radius of towns unless special permission is granted by the inspector and then not more than 40 miles. Beyond these distances there are no provisions except for wholesale delivery between licensed distributors. A $500 bond is required for each truck to insure compliance with all regulations.

The real "teeth" of this law are in the rules laid down for the conduct of all persons engaged in trucking of fuels. Licenses must be carried at all times together with bills of lading covering the load, kind and amount of fuels, origin and destination, and the names of the consignor and consignee. All loads must be sealed at the point of origin within the state and at the designated port of entry when coming into the state. These seals must not be broken except at the destination indicated on the bill of lading or at the port of exit on the state line.

On first conviction a violator may be fined from $25 to $500 and imprisoned up to three months, while a second or subsequent conviction carries an arbitrary fine of $500, or imprisonment up to six months, or both. Trucks and contents operated in violation of the law may be seized.

Kansas Jobbers Re-elect A. C. Carpenter

WICHITA, March 31.—For the eighth time Kansas marketers have elected A. C. Carpenter, Lesh Oil Co., Ottawa, to be president of the Kansas Oil Men's Association, at the convention here March 30, 31.

John A. Motter, secretary, also has been honored by being elected to that office for the eleventh time.

Other officers selected at the convention, all re-elected excepting the second vice-president, are: R. W. Beach, Beach

Oil Co., Abilene, first vice-president; T. A. Helling, El Dorado Refining Co., El Dorado, second vice-president; S. W. Neely, Farmers Co-operative Association, Bucklin, third vice-president; R. M. Marks, Cunningham & Marks, Baxter Springs, fourth vice-president; and W. C. Long, Golden Rule Refining Co., Wichita, treasurer.

The new Kansas motor fuels tax law was the main topic of discussion. Speakers were W. E. Brown, attorney for the Sinclair Refining Co., Kansas City, and chairman of the Kansas Tax Evasion Committee; John W. Blood, Wichita, floor leader in the house of representatives, who was instrumental in drafting the new law; and Seth G. Wells, state oil inspector, who will administer the new law.

Other speakers at the convention were P. B. Armold, business analyst-sales counselor, Los Angeles; Victor Murdock, editor of the Wichita Eagle, Wichita; and Harry Sharp, secretary of the Associated Industries of Kansas, Wichita.

Marketing, Trucking, Legislation Topics at Detroit Meeting

DETROIT, March 31

SERVICE station merchandising, truck transportation, the banking situation, government in business, and organization work were discussed at the Michigan Oil Men's Association convention here March 29 to 31.

That the oil tariff probably has been a subsidy to industry to cover wasteful, uneconomic methods, was suggested in an address on government in business by Ross Campbell, secretary and counsel, White Star Refining Co., Detroit.

Mr. Campbell was critical of the attitude of those scorning government in business. He pointed out that we have invited government to participate in business; that we have only ourselves to blame for excessive taxes as we have grown careless; that many have the concept of government as a big brother and a legal adviser to business; and that government in business would not be necessary if business had the concept of service to its customers, instead of profit for itself.

Suggested changes in government in business, were reform of the anti-trust laws; a federal system only of taxation on petroleum products, instead of the present 49 systems; withdrawal of the oil tariff; railroad reforms; and the federal control of production in natural resource industries.

Merchandising addresses centered on the importance of salesmanship in the station. Dudley Fitts, Stevens-Davis Co., Chicago, said that customers buy when they are convinced it is to their advantage to buy.

As an example he took the customary oil sales approach of, "May I check your oil?" Instead, he suggested an approach that would be of interest to the customer, such as "Shall I see if your oil is safe?", pointing out that this causes the customer to think of the use of that oil in protecting bearings and of protection against repair bills.

Harry G. Mook, general sales manager, Plymouth division of Chrysler Corp., Detroit, urged marketers to consider the rising market of 40 million persons now under 24 years of age in this country who are becoming prospective purchases of cars.

Research and study of selling was urged also by Mr. Mook. Only the surface of selling has been scratched, and selling costs are out of proportion, he said.

That marketers should inform the public, which is contacted frequently, about the truth of truck transportation, and that truck legislation should not be what the railroads or truckers want, but what is best for the public, was told marketers by L. C. Allman, Fruehauf Trailer Co., Detroit.

A. D. Dubuisson, Wolverine Service Stations, South Haven, Mich., spoke informally on trucking and suggested that marketers inform the railroads of the business obtained from the oil industry. He pointed out that legislation that keeps a truck from the highways prevents that truck from consuming gasoline, and in turn the railroad does not transport that gasoline in a tank car to the marketer's bulk plant.

George L. Clark, director of the state gasoline tax division, was applauded when he told marketers that Secretary of State Fitzgerald would strenuously oppose any legislation to increase Michigan's tax.

Organization work and its benefit to marketers was the topic of Earle W. Hodges, Henry L. Doherty & Co., New York; E. V. Weber, Eureka Oil Co., Reading, Ohio, and Orville B. Gault, National Standard Parts Association, Detroit.

Michigan Association 1933 Officials

President, J. F. Wilson*, Star Oil Co., Port Huron.

Vice-president, J. G. Schindehette, Saginaw Oil Co., Saginaw.

Treasurer, J. G. Slavik*, Cities Service Oil Co., Adrian.

Executive Director, H. H. Ragle*, Jackson.

Directors: W. D. Gowans*, White Star Refining Co., Detroit; J. G. Schindehette*, Saginaw Oil Co., Saginaw; Peter Jensen, Hansen & Jensen, Escanaba; R. C. Beland, Southwestern Oil Co., Niles; J. F. Wilson*, Star Oil Co., Port Huron; S. B. Spalding*, Arrow Oil Co., Lansing; J. G. Slavik*, Cities Service Oil Co., Adrian; E. J. Huntington*, Abbott Gasoline Co., Ann Arbor; J. J. Theisen, Jr., Theisen-Clemens Oil Co., St. Joseph.

***Re-elected.**

Viking Representative Dies

LOUISVILLE, Ky., April 1—Floyd Sargent, Kentucky representative of the Viking Pump Co., died March 21, following an emergency operation, according to the current bulletin of the Kentucky Petroleum Marketers Association. He was 46 years old. The body was taken to Cedar Falls, Ia., where Viking has its headquarters, for burial.

High Crude, Cheap Products Blamed For Ohio Standard's 1932 Loss

CLEVELAND, April 3

THE difficulties of a refining-marketing unit in the face of a decline in consumption and an imbalance between posted prices of crude oil and realized prices of the products, are outlined and analyzed by W. T. Holliday, president of Standard Oil Co. of Ohio, in his annual report to stockholders.

The Standard of Ohio had a net loss of $1,206,361.18 in 1932, compared with a net profit of $2,359,173.18 in 1931. These amounts are after deduction of all expenses, costs, taxes, interest and reserves for depreciation.

Gasoline consumption declined 8.6 per cent in 1932 in Ohio where the Standard of Ohio's marketing activities are concentrated. This percentage of decline is that shown by the state gasoline tax figures.

Accompanying this decline, Mr. Holliday pointed out, the most demoralized gasoline market experienced in at least four years. Under a pressure of an excessive potential supply of crude oil and a struggle to push this excessive supply on a declining volume-market, prices were cut openly and secretly until the retail price of gasoline fell to the lowest level in Ohio since gasoline became a principal product and not a by-product of kerosine. The net price of regular grade gasoline fell to 9 cents a gallon ex tax.

A large part of the marketing trouble, Mr. Holliday indicated, came from fixed margin contracts which gave the dealer and the distributor without refining facilities an inflexible gross profit per gallon whether the posted retail price was high or low.

"The net result of these practices (fixed marginal contracts), Mr. Holliday said in his report, "is to give such distributors an underwriting which relieves them from all interest in the ultimate service station price. This has taken from such distributors any regard for the effect which their price cutting or other marketing practices might have in the way of breaking down posted retail prices.

"In a time of diminishing consumption there has been a special urge upon such distributors to endeavor to hold or increase their gallonage by price cutting and special concessions. Reduction of the posted price fails to meet such competition because the distributor, buying upon a margin off the service station price, immediately has his cost correspondingly reduced.

"This system of marginal contracts, therefore, has created a force running directly counter to the efforts of the crude oil producing branch of the industry to raise or maintain the crude oil prices. The efforts of marketers adhering to the code of marketing practices to meet the price cuts of marginal contract buyers by open, posted price reductions has simply resulted in further secret cutting and lower net back prices to the refineries."

Mr. Holliday then reviewed the price situation in Ohio last year when the prevailing margin to jobbers was 5½ cents a gallon off the posted service station price of gasoline. Price cutting brought on the introduction of the commercial discount at Ohio stations but discounting spread to non-commercial as well as commercial buyers of gasoline. Concerning a remedy Mr. Holliday wrote:

"IT SEEMS manifest that, for orderly marketing, the oil industry needs not only stabilization in the crude oil production end of the business but the elimination of the flat marginal contract on gasoline sales and the substitution thereof of some sales arrangement with jobbers which will give them an interest in the ultimate retail price.

"Selling through jobbers undoubtedly is the most economical method of distribution for many refiners, and in our judgment jobbers have an economic place in the industry, but any saving to refiners from distributing through jobbers is now being offset by low net backs to refineries, resulting from the destructive effect upon ultimate prices of the flat marginal contract.

"It is to be hoped that some reform will be effected in jobbers' contracts so that the jobbers as a class will have an interest in retail prices, since otherwise the policy of open and posted prices cannot be maintained in the face of declining consumption."

Last year was the first full year in which Standard sold a third grade gasoline. In spite of diminished purchasing power by motorists the proportion of third grade gasoline sales to total gasoline sales was unchanged from that in 1931—approximately 11 per cent. However, the sale of higher octane regular gasoline cut into the

Earnings Statement of Standard Oil Co., Ohio, and Subsidiaries

	1932	1931
Gross sales	$58,714,734.23	$67,882,044.73
Gasoline and oil taxes	11,852,255.24	12,013,147.82
Net Sales	$46,862,478.99	$55,868,896.91
Cost of goods	34,000,488.25	37,314,300.68
Marketing expense	10,990,563.27	12,867,708.48
Operating profit	$ 1,871,427.47	$ 5,686,887.75
Other income	641,241.93	817,013.43
Total income	$ 2,512,669.40	$ 6,503,901.18
Other expenses	761,910.08	745,933.21
Net earnings before depreciation etc.	$ 1,750,759.32	$ 5,757,967.97
Depreciation	2,955,307.61	3,255,919.16
Minority interests' share in profits	.....	27,267.68
Federal income taxes	†1,812.89	115,607.95
Net loss	$ 1,206,361.18	*$ 2,359,173.18

*Net Profit †of subsidiary company

sales of premium anti-knock gasoline.

At the company's service stations sales of premium anti-knock gasoline in 1932 made up 23 per cent of total gasoline sales, compared with 35.6 per cent in 1931 and 54 per cent in 1930. Combined bulk and service station sales showed 18.4 per cent to have been of premium grade last year, compared with 28.5 per cent in 1931 and 45 per cent in 1930.

This trend from premium to lower priced gasoline caused a fall of 0.47 cent per gallon in the weighted average realized price on all grades, although the average retail price was 0.15 cent higher than in 1931.

Ratio of motor oil sales to gasoline sales declined, Mr. Holliday said. His company early last year put a 15-cent oil into its stations. This oil, he said, helped to meet the low priced competition arising from sale of oil in two and five-gallon cans by department stores, mail order houses and other "outside" outlets without converting the regular purchasers of 25 and 30-cent oils to use of the cheaper oils. Sales of industrial lubricating oils declined 25 per cent, he cited.

Sales of heavy fuel oils increased about 17 per cent over 1931 sales. Prices, however, were lower than in any year on record but improved in the late months of 1932 when automobile manufacturers began to buy steel and parts from Ohio plants for new production.

SALES of tires and automobile accessories increased over 1931 sales with increasing revenue.

Standard of Ohio eliminated 29 more bulk plants in 1932. This makes a total of 159 bulk plants eliminated the last few years with the development of the company's motor transportation system. After a 25 per cent depreciation charge and 6 per cent interest on investment in motor transportation equipment, the company's saving over short haul rail transportation costs was $172,536.37 although rail rates were reduced last spring in an effort of the railroads to meet competitive trucking costs.

Seventeen truck and trailer units operated by the company hauled 69,191,224 gallons of gasoline, kerosine and oil in addition to some cased goods. This is an average of more than 11,000 gallons per unit per day over a 366-day period.

Mr. Holliday in discussing general economic conditions within the industry, pointed to the difficulties of economic planning to bring crude oil production in line with market demand. These difficulties include the intra-state production of crude which makes a general, rational plan virtually impossible under present laws, the fundamental law of oil and gas as developed in the courts in the early days of the industry, the anti-trust laws and human nature—the desire of producers and royalty owners to realize now on their holdings.

HARKENING to the voice of hundreds of thousands of producers and royalty owners, political leaders in oil producing states have bent their efforts more toward maintaining high posted prices for crude rather than at conservation, is the substance of Mr. Holliday's introduction to his discussion of production the last year.

"The fact, therefore, that posted crude oil prices have been so unduly high in relation to prices of the finished products—so out of harmony with the relativity which would exist if economic forces were operating freely—is to be explained largely as a 'bribe' which has been given to producers and royalty owners in order to procure their support for a program of economic planning, which support, in fact, was necessary to prevent their own financial destruction," he wrote. "This 'bribe,' however, has had to be borne by the refining-marketing branch of the industry, which, except in so far as it has an investment in crude oil production, has received comparatively little benefit from the curtailment program.

"Because of the strong economic forces tending toward lower oil prices in 1932, the proration machinery of the important oil states in that year, as never before, became dedicated to the ulterior purpose of price maintenance rather than of simply restricting production to marketing requirements or the avoidance of physical waste. The result was that during 1932 posted crude oil prices at practically all times of the year were kept at a level which made it impossible for the purchaser of crude oil at such posted prices to refine it and to secure a revenue from the finished products equal to the costs."

Mr. Holliday then reviewed the crude oil price changes of 1932, the selling of crude below the posted prices, the production and sale of "hot" oil and its demoralizing effect upon the markets for finished products. He gave 87 cents as the average price of 36 gravity Mid-Continent crude in 1932, compared with 63 cents in 1931, an increase of 24 cents a barrel in 1932. Increases in value of products in the Tulsa market amounted to only 8.214 cents a barrel, he asserted.

"Essentially, therefore, the loss sustained by the stockholders of this company in 1932 was, for all practical purposes, part of the tribute secured by the producing end of the industry at the expense of the refining-marketing end, and represents this company's contribution to the tuition fee which was paid in 1932 for the education of the southwest in the futility of attempting to secure satisfactory prices without first dealing with the economic forces of which price is merely the results," he declared.

STANDARD'S balance sheet of Dec. 31, 1932, shows current assets totaling $14,885,977, including $4,723,207 cash and $1,210,970 U. S. government and other securities. Current liabilities totaled $4,416,996, including dividend of $150,000 payable on the preferred stock Jan. 15. At the end of 1931 current assets totaled $15,759,456, including $2,976,109 cash and $1,343,246 marketable securities, and current liabilities $4,376,180.

Total assets, after deducting $18,941,792 depreciation reserve, amounted to $60,407,284. Last year the company paid its full referred stock dividend and $2 a share on the common. No action was taken on the common the current quarter.

Code for Federal Bus and Truck Regulation Written

WASHINGTON, April 3 ATTORNEYS for railroads, state commissioners, the American Highway Freight Association and the National Association of Motor Bus Operators have formulated a code for federal regulation of common and contract truck and bus operations through the agency of the Interstate Commerce Commission. The code is as strict as that adopted by the state commissioners at their convention at Hot Springs last fall.

Under the bill the federal body would have the power to deal with rates of the common carriers in the way it deals with rates of steam railroads. Rates of contract carriers would be regulated only to the extent of forbidding unduly low ones. The common carriers would have to file their absolute rates. The contract carriers would have to file and observe only minimum rates.

In addition the federal commission would be empowered to prescribe regulations for safety and hours of services for employes as well as require the filing of bonds or carrying of insurance protecting the public. The bill provides for the federal body calling state commissioners to its assistance when applications for certificates for common carriers or permits for contract carriers were pending or when their rates were assailed.

However, the state commissioners wrote into the bill a reservation against the federal body so that it could not, if so minded, strike down state rates, laws or constitutions as it does now to remove discrimination against interstate commerce.

Representatives of the steam carriers, electric carriers and truck operators did not agree to that reservation. It was insisted upon by the state commissions and the bus operators as fundamentally necessary to make the bill satisfactory.

Coincident with the framing of the new bill a group of farm organizations protested to President Roosevelt against having trucks regulated by the same agency as railroads. The farm organizations also urged against regulating contract carrier rates and against halting competition between motors and railroads.

Thomas B. Bennett Dies Of Heart Disease

MUSKEGON, Mich., March 31.—Thomas B. Bennett, 43, well known service station equipment manufacturer here, died at his home Tuesday night. While talking with a son Mr. Bennett fell from his chair, death being caused by heart disease.

Mr. Bennett was survived by his widow and six children. Funeral services and interment were at Muskegon Friday.

As head of the Bennett Pumps Corp., Muskegon, Mich., Mr. Bennett was well known among oil marketers since the early 1900s. He is credited with being a pioneer of the "high-boy" tank for storing oil in service stations, and also of the barrel pump. In 1931 his company became part of the present Service Station Equipment Co.

Recently Mr. Bennett had returned to the service station equipment field, and had organized the present Muskegon Bennett Co. for manufacturing low pressure lubrication equipment and the "high-boys."

New Marketing Program Planned by S.O.N.J.

NEW YORK, March 25.—A new marketing program is being planned by Standard Oil Co. of New Jersey, Standard Oil Co. of Louisiana and the Colonial Beacon Oil Co. J. E. Skehan, vice-president of the Standard of Louisiana who has previously been located in New Orleans will be located at 26 Broadway for some time. J. R. Riddel, vice-president of the Colonial Beacon Oil Co., who has been located in Boston, will also direct activities from 26 Broadway.

C. G. Sheffield will be in complete charge of all service station gasoline sales for Standard Oil Co. of New Jersey, Standard Oil Co. of Louisiana, Standard Oil Co. of Pennsylvania, Colonial Beacon Oil Co. as well as the sales of the parent company. Associated with Mr. Sheffield will be E. A. Holbein who will handle tank car sales. R. G. Stewart who is co-ordinating director of the Standard Oil Co. of New Jersey will direct the sales activities of the parent company and its subsidiaries.

S. O. Indiana 1932 Profit Put at $16,500,000

CHICAGO, April 3.—Net profit of Standard Oil Co. of Indiana for 1932 was approximately $16,500,000, or about $1.03 a share on 15,941,894 shares outstanding Dec. 31, 1932, according to a preliminary calculation announced today by Edward G. Seubert, president. In 1931 its net profit was $17,596,396.

Exact and final figures on earnings and other details regarding the company's operations and its financial status at the end of 1932 will be reported at the annual meeting of stockholders May 4.

The profit figures for 1932 are after depreciation, depletion, amortization, inventory adjustment and federal income and foreign taxes.

Commenting on the estimate, Mr. Seubert said that 1932 earnings were achieved largely from basic operations and investments and through economy. Conditions in the gasoline marketing field were generally adverse.

Dividends were paid by Standard of Indiana throughout 1932 at the rate of 25 cents a share per quarter. Total dividends paid to stockholders by Indiana company and subsidiaries was $16,689,277.

Recommends Graduated Tax to Halt Overproduction in Texas

By Paul Wagner
N. P. N. Staff Writer

By Telegraph
HOUSTON, April 3

TWO efforts to end what Gov. Ferguson described as a "Reign of terror" got under way at Austin, Monday, in addition to a new state-wide proration hearing before the railroad commission.

In the lower house of the legislature debate began on the bill to establish a natural resource commission which would take over oil and gas regulatory duties of the railroad commission. The new board would consist of three persons to be appointed by the governor.

The governor sent a message to the legislature recommending a graduated production tax on oil of 2 cents per barrel for the first 150 barrels produced daily from any well. The tax would advance to 5 cents per barrel on the next 100 barrels produced and to 25 cents per barrel on all oil produced in excess of 250 barrels. For all practical purposes the proposed tax would limit production from any well in the state to 250 barrels daily. The present tax is 2 per cent on the market value of oil produced regardless of quantity.

Gov. Ferguson also asked the legislature to enact a law making overproduction a prison offense. She suggested that anyone knowingly producing oil in excess of the proration allowable be imprisoned from one to five years. She said that people who live in East Texas are "disturbed in mind and spirit beyond comprehension. This desperate condition has reached the stage where heretofore law-abiding citizens are arming themselves with firearms and are threatening to take the law into their own hands if the rights of property owners and persons are not in some way protected by law."

On the eve of Monday's state-wide proration hearing Attorney General Allred expressed doubt of the validity of any railroad commission order limiting production of any well in East Texas below the 40-barrel statutory minimum for pumpers deeper than 3500 feet.

Allred ruled that the commission is not required to use an acreage factor in its order but that if larger production is not allowed wells on larger tracts that Rule 37 limiting drilling may be struck down.

Commission members told Allred their study of court decisions indicated that they must issue an order based solely on well potentials. Allred, however, expressed the opinion that the commission might consider acreage, sand thickness, bottom hole pressures and permeability and porosity of oil sand.

In the course of the hearing Monday Robert E. Hardwicke, attorney representing the Texas Oil & Gas Conservation Association, pleaded with the commission not to fix the East Texas minimum allowable at 40 barrels. He said that if Allred's interpretation were followed the allowable for the field would be somewhere between 600,000 and 1,000,000 barrels daily. This, he said, would wreck the field.

Hardwicke said that the commission should "resolve the doubt in favor of proration," since Allred had not ruled formally on the question.

Allred then announced that one federal judge had advised the commissioners they had only one more chance to write a valid order and called attention to their citation by Federal Judge Bryant to appear before him April 8 to show cause why they should not be held in contempt of court. The open flow test proposed a week ago by the commission to obtain data on the field's potential was stopped by a restraining order granted March 29 to Capt. J. F. Lucey, president of Lucey Petroleum Corp., by Judge Byrant. On March 31 this order was modified by the court to permit the railroad commission to shut in the field for five days if that course should be deemed advisable.

The same date Judge Bryant gave British American Oil Producing Co. an order permitting it to produce 300 barrels per well daily from its 25 wells pending a hearing 10 days hence.

An appeal was sent by the railroad commission to the legislature for jail penalties for proration violators. In its statement the commission charged that there is no overproduction today but that big companies want output curtailed so they can raise the price and draw on their large storage.

"The public should know that there is actually no over-production of oil in America today," the commission said. "As a matter of fact, 31,000,000 barrels of oil were withdrawn from storage last year. Those in charge of the oil industry, the big companies, are asking to have production of oil in the United States restricted to 2,000,000 barrels a day as a matter of fact the total demand is 2,500,000 barrels a day.

"Some big companies have on hand in storage 585,000,000 barrels of oil. They wish production curtailed so that they can sell off this oil they have in storage. They are asking to

Daily Average Production, Important Districts, American Petroleum Institute Figures

	Week Ended Apr. 1 Barrels	Mar 25 Barrels
Okla. City	134,550	250,700
Total Okla.	427,700	563,800
East Texas	398,750	360,800
Total Texas	949,300	914,250
California	459,900	373,700
East of Rockies	1,779,850	1,875,950
Total U. S.	2,239,750	2,249,650
Crude Imports	98,710	112,430
Total New Supply	2,338,460	2,362,080

have the railroad commission of Texas help them correct their mistake in storing too much oil. That is not within the scope of our powers.

"Conservation does not necessarily mean restriction of supply. Our duty is to prevent waste. We are not a price fixing body. Price fixing is against the genius of our government.

"There is much talk about oil bringing a dollar a barrel if the railroad commission will restrict production sufficiently to make it scarce. We cannot consider this question at all. That has been the source of most of the dissatisfaction. One group wishes the commission to restrict production so that the price will be higher. Another group wishes to be permitted to produce enough oil to exist.

"Our duty is to the entire people of Texas. We must serve those who buy gasoline and oil just the same as we do those who produce oil."

New Conservation Board

LITTLE ROCK—In the closing moments of the Arkansas legislative session, an act creating a conservation board of five members was passed. It has been signed by Gov. Futrell. The board is to have its headquarters in the oil district of South Arkansas.

Tank Truck of Bootlegger Confiscated in Texas

PORT ARTHUR, Tex., March 29.—A truck loaded with 1000 gallons of bootleg gasoline was confiscated as it entered the city today. At police headquarters the driver said he had been supplying about 20 service stations in Port Arthur for a year.

The gasoline was obtained in East Texas and trucked to Port Arthur without payment of the state tax.

City Judge H. H. Hendryx fined the driver $10 and remitted costs when he told the judge that he "had to make a living." The charge on which he was fined was that of selling gasoline from an unmarked container.

Recently two other men were fined $25 each by the city on charges of bootlegging gasoline.

Close Oklahoma City Wells Wasting Billion Feet of Gas Daily

By Telegraph

OKLAHOMA CITY, April 4.—The Oklahoma Corporation Commission today issued an order shutting in all wells in the Oklahoma City field except those making more than 10 per cent water which will be allowed 100 barrels each per day. There are 112 of these.

The order is to be effective April 5 and will remain in force until potential gauges can be taken. Arrangements for these are not yet complete. The order affects 459 wells in addition to those in the Wilcox sand which were shut in Saturday.

TULSA, April 1

THE 438 Wilcox sand wells in the Oklahoma City field were closed at 7 a. m. Saturday morning by order of the state corporation commission, to take potential gauges.

This action followed hearings before the commission at which it was developed that the waste of gas occurring would within a short time deplete the supply to the point where no flowing wells would be left. It was asserted by engineers that at the rate of production the past two weeks, the flowing life of the Wilcox zone would be ended in 30 days.

Only the Wilcox zone is affected by the order and the 571 other wells in the field are permitted to produce the amounts of crude oil allocated to them in the new proration order for April. Total allowable production during the shutdown is 45,880 barrels. The Wilcox sand zone, under the new order, had been allotted 94,115 barrels daily.

Total allowable production for the state in the April order was set at 425,913 barrels, a decrease of 40,213 barrels from the March figure. The Oklahoma City decline was 12,919 barrels. The new order was based on nominations given in hearing before the commission.

The shutdown order came after testimony revealed the huge waste that is occurring in the field. Engineers estimated the gas production in recent days at one billion feet per day and said that more than 75 per cent of this was going into the air, either directly from the well or as residue from gasoline plants.

W. N. Stokes, general counsel for the Slick interests, filed the petition asking the corporation commission to issue the shutdown order. In the hearing which followed, the Phillips Petroleum Co. removed its application for the taking of new potential gauges in the field. The Phillips argument included a statement on waste of gas. Company attorneys asserted that the pressure on the Wilcox zone is down to 1300 pounds, that under recent conditions of waste it has been falling 100 pounds each 12 days.

Data on 10 wells belonging to the Phillips were presented by Don R. Knowlton, company petroleum engineer. He said their average pressure was 1340 pounds. Within a month, if the huge withdrawal of gas were to continue, the pressure on the group would have fallen to 1000 pounds. Many Wilcox wells will fail to flow with so low a pressure. The figures given refer to shut-in, not bottom-hole pressures.

New gauges on the Wilcox sand wells will show a great decline from their present ratings. No general potential test of the field has been made since 1931 and the rating of more than four million barrels now given the field will at least be cut in half when new tests are made, most production men believe.

Knowles Representative in Tulsa

TULSA, April 1.—R. S. Peterson, of Brassert-Tidewater Dev. Co., Chicago, has been spending some time in the Mid-Continent visiting refiners. He paid a visit to Tulsa this week.

This company recently added to its technical force J. T. Zoll, recently superintendent of the White Star Refining Co. at Detroit.

Close Study of

CURRENT MARKETING PROBLEMS

Required of Oil Executives

By P. M. Miskell*

(Presented before Western Petroleum Refiners Association, Hot Springs, Ark., April 5-6)

IN THE selling of petroleum products, we have seen in the past and are now seeing some of the most peculiar and contradictory conditions ever to prevail in any industry. There has at all times apparently been almost an utter disregard of good business sense, and we are paying a mighty stiff price for this lack.

A casual glance shows a confusing amount of backing and filling; changing unwise policies for others even less wise; investing millions in service stations and then creating our own ruinous competition by giving dealers and sometimes jobbers such a subsidy as absolutely guarantees them against loss; giving service station discounts, although convinced that it is in error, and further losing all control by allowing them at time of delivery; using methods that cause dishonesty among our employees; not only selling our goods at no profit, but frequently paying some one to take them; continuing to multiply our retail outlets, regardless of the known reduction in consumption; adopting and discarding discount schedules bearing no relation to handling costs or other justifying economic factors; camouflaging deals we are reluctant to make openly; and, above all, breaking down our confidence in each other.

With every apparent need for a painstaking appraisal of resources and their most effective use, we find the marketing branch of the petroleum industry continuing to waste its strength on intra-family brawls. Sound competition is the life of trade, but here is an industry in which competition is unsound and means not life, but death—not just to the loser, but to the victor, as well. With successful solution of our problems as the reward for co-operative study, we seem bent on going down to destruction in a riot of selfishness and ignorance.

For years we have had ample information as to the possible consumption of our goods and our potential production, but, beyond okehing the expense of preparing the data, our leaders seem to have paid little attention to it. There have been a few who have tried to make themselves heard in a plea for common sense. In meetings they have been listened to with respect. Everything they have said has been given the nod of approval.

The familiar pattern of the recurring meetings is a picture of futility. They have produced nothing but bigger and better sobs. Why? Because as a group we have shouted: "There ought to be a law," while as individuals we were keeping our fingers crossed and whispering "But I will have to vary from it because my case is a little different—my production is increasing, and I must distribute it."

Twenty-four hours later the others knew how we were varying from the ethics we had applauded. Self-protection forced others to meet the exceptional case and so each of the long series of unprofitable practices peculiar to our industry has been born, sturdy and wilful infants all.

These conditions, the factors which contribute to them, the policies under which the various companies are attempting to meet the conditions, the abuses and uneconomical features of the present policies are so well known to all concerned that it should not be necessary to give any more time to their study. Without further delay, all possible energy should be devoted to developing new policies which can be reasonably expected to result in improved earning power for the industry.

THE only practical way to arrive at specific conclusions, instead of generalities, and to properly develop specific plans and policies, is to look not at today, but at some date possibly several years in the future; that is to say, the applying of plans designed to meet emergencies which exist currently will only leave us struggling with each day's new problem and frequently tearing down yesterday's constructive work in order to hurriedly build defenses in some new direction.

The first thing to be done must be the setting up of a definition of what we ultimately wish to attain. This undoubtedly is a marketing policy which will result in fair, consistent, and reasonably regular profits. Every move made now should be part of a program of development which can be expected to continue over a period of years.

*Vice-president, Empire Oil & Refining Co., Tulsa.

This means that we must immediately decide what is necessary to give us profit on the basis indicated. Having decided what is necessary, we will then be in position to work toward the establishment of those conditions.

A primary factor is *spread*, or the difference between our cost of goods and our selling price. We must determine what spread is necessary to properly cover all the expenses involved in marketing, plus the reasonable profit already referred to. If we are agreed that the creation and maintenance of such a spread is the primary factor necessary, we must then not only determine what this spread should be, but we must also develop a sound and practical method for maintaining it. In determining what spread is necessary, we must consider, first, what the per gallon expenses of a marketing organization may be. These expenses are affected by:

1. Company policies as to the amount being expended beyond current needs for the purpose of developing future business;

2. Company policies as to investments in the physical features of the stations operated;

3. Company policies as to service rendered customers beyond that actually necessary for the delivery of the products, particularly at service stations;

4. Company policies as to the frequency with which they change dispensing equipment for the purpose of providing improved service or of securing additional business by using the offer of improved equipment as an added sales argument, thus promoting premature obsolescence;

5. Company policies as to unnecessary quality in the products beyond the current economical need of the equipment in which the customer proposes to use the products;

6. Tank station truck delivery radius in relation to tank station volume;

7. Total volume of products sold;

8. Unit volume of products sold per tank station, service station, and dealer account.

For all competing companies to adopt exactly uniform policies on many of the factors we have just listed would probably be impossible, and, in the interest of healthy competition, actually undesirable. A wide variance in opinion is certainly to be anticipated with respect to many of these policies; but the last three items named are not policies, but rather the result of policies.

If we agree that per gallon expense is lowered when our tank trucks are delivering in an area of well developed gallonage for the company operating the tank truck; when our total volume of products sold is larger; and when our sales per unit station are greater; then we should be interested in any general policy which might be expected to contribute to these developments.

THERE are only two ways in which the average unit gallonage of the industry's retail outlets can be increased; first, by increasing total demand for the industry's products at a greater rate than we increase the number of retail outlets; second, by reducing the number of the industry's retail outlets.

Creating increased demand for the industry's products would appear to be temporarily beyond our power. Even if we solved the problem and were successful in creating increased demand, it would be impossible to take advantage of that demand unless we fulfilled completely the conditions outlined, namely, increased the demand faster than we allowed the number of retail outlets to be increased. For this reason, it would appear that we are forced to turn toward the second alternative. It is obviously involved in either case; that is to say, we must work toward the reduction of the number of the industry's retail outlets.

Our retail outlets are in three classes, namely, company-owned, company-controlled, and open accounts. The main volume is through the first two classes, and our study should first be concentrated on them. The spread determined on should be such as to make possible the profitable operation of units carrying a reasonable gallonage. It will be necessary to determine what should be considered a reasonable minimum gallonage. Certainly there are hundreds of outlets now operating that would not qualify under any sound definition of the designation "reasonable minimum volume." In many cases these small volume outlets, if company-owned, are losing money; but, where they are dealer-owned and only company-controlled, they may be making money for the dealer due to the extensive subsidy the supply company is giving the dealer.

There should be such a dealer discount structure as would give proper profit to the dealer account of reasonable size. Possibly the discount schedule which most companies say they are now following is a proper one; but, as a matter of fact, many companies give dealer accounts not only the amount provided in their declared policy, but additional amounts.

With this additional money received in the form of excessive rentals or commissions, the dealer, through the use of open price-cuts, as well as secret rebates, takes business away from our company-owned retail outlets, continually carrying our company-owned outlets into a lower average gallonage, with consequent sacrifice of opportunity for normal profit. Considering the investment involved in these company-owned outlets, it is hard to understand the industry's action in this connection.

The open dealer accounts are largely garages, parking lots, small town stores, roadside and crossroad installations. The average gallonage is small; but the narrowing of the discount given to such accounts will not stop the creation of them for the reason that they are not ordinarily dependent on the sale of petroleum products. The sale of gasoline and oil is a side line, producing added revenue without added expense. The industry makes this possible through its policy of loaning equipment.

Returning to consideration of the discount to which the dealer is legitimately entitled, we must recognize that conviction on the part of all concerned will not be sufficient to assure the actual use of such a basis. Companies will vary from the apparently wisest policy to the extent dictated by their personal views and permitted by

the gross profit spread on their goods. To see the wisdom of a given discount schedule for dealer accounts will be of no value unless we also find ourselves regularly with a certain total unit spread.

The only way to control and keep healthy our gasoline spreads is by basing the posted service price on the current cost of goods; that is to say, at any given time refinery price plus freight, plus taxes, plus a proper spread would equal the posted service station price on gasoline. If a dominant marketer in any given territory were to follow a policy of this nature, possibly posting price changes at the rate of ½ cent at any time a variation of ½ cent had occurred in the refinery tank car market, it is safe to assume that other marketers would adopt the same practice.

Under the operation on such a price structure as had been described, unreasonable flat rentals would die a natural death. In fact, flat rentals would probably eventually apply only where the company was securing the outlet for a long term of years on a non-cancellable basis, with the intention of operating as a company unit, and in no way employing the owner or lessor in the operation of that particular station.

The price structure we are thinking about would leave no room for a service station commercial discount. Farm discounts, too, should be discontinued. It is impossible to reconcile the practice of giving farm discounts with the marketing costs involved.

Industrial or consumer accounts (except farm and road contractor accounts) buying on tank wagon delivery should receive discounts based on volume purchased from each individual tank station. This will relate the net price to the delivery and handling expense. The theory of discount for quantity purchasing has always been sound when increase in the purchased quantity made possible manufacturing or distributing economies on the part of the supplier.

In oil marketing, a large total purchase which involves delivery at a large number of points does not necessarily, in itself, permit economical handling by the supplier. The factor which determines the possibility of operating economies is the volume taken by the customer at the individual tank station. Using the suggested method would mean that a given account buying at two or more points might receive a different rate of discount at the various points.

Road and construction contractors working on highway surfaces, bridges, etc., either as construction or repair, buy on tank wagon delivery and frequently require long or difficult hauls. This should be kept in mind when considering a proper price schedule to apply to this class of business.

COMPANIES marketing through jobbers, in addition to their own organization, should assume more and more responsibility for guiding the jobber toward sound business methods. At times this responsibility has not been assumed to the proper extent, and, in fact, it would appear that there have been instances where jobbers have been purposely used as back doors by well known companies; that is to say, the big company has encouraged and helped the jobber to secure business on a special basis at the very moment that the big company itself was loudly insisting that everybody follow the formal marketing policy of the industry.

Furthermore, we should consider the hidden discounts offered by real or implied extra quality sufficient to really take the product into the next higher grade. This is allied with the advertising ethics to govern in presenting products before the public. The extreme of this is found where a company, in advertising their regular gasoline, chooses not to stress its quality as such, but, rather, the fact that it is really a premium gasoline, sold at the prices of regular gasoline. The only real title for this is "price cutting."

Any study of our problem certainly must include the question of loaned equipment. The investment in this item draws attention; but of equal importance is the expense of maintenance, installation, removal, etc. Certainly no equipment should be loaned to open accounts. Where equipment is now installed at such accounts on a loan basis, the customer should be required to purchase same on a cash basis at a mutually agreeable price. To get the full benefit from such a move, we should apply the same conditions to leased accounts. There is no sound reason why these should not come fully equipped to do business.

Many more details crowd before us for consideration; but we are not being suddenly confronted by an array of new and unknown difficulties. They are the same old crew of troublemakers, the subjects of convention speeches for years. This is no surprise attack. The amazing part of it all is the apparent lack of knowledge and understanding by many of the top executives. Our troubles are not a part of the current business let-down. When all other industry was in the late lamented bull period, we in petroleum were suffering just as now. The only difference is that now general conditions force us to pay more heavily for our folly. As other commodities have declined, the price of ignorance has increased.

A code of ethics was given governmental sanction and adopted by the industry. Before the ink was dry, some were cudgeling their brains for ways and means to stay within the letter and outside the spirit. No code is stronger than the honesty and sincerity of the individuals subscribing to it. We muffed this chance.

We believe it can be stated without fear of contradiction that a situation exists in the oil business that exists in no other business, and that is the executives of oil companies refuse to inform themselves of the activities of their sales departments. They have concerned themselves mainly with total gallonage figures, maintained uncalled for manufacturing schedules on the premise that costs would be reduced and with no regard as to how the excess production affected prices, called on their sales departments to produce volume which would balance a production volume or refinery potential capacity which had been created without regard to market or trade territory possibilities.

Effect of Acid Treatment on Octane Values of Cracked Gasolines*

By Sidney Born[1]

(Presented before Western Petroleum Refiners Ass'n., Hot Springs, Ark., April 5-6, 1933)

THE increasing use of high compression motors in the automobile industry has necessitated the use of fuels of higher octane rating. Since the manufacture of such fuels is a result of various cracking processes, the refiner has been forced to augment his facilities for this processing in order to meet the present day market demands.

The processing of raw cracked gasoline or pressure distillate involves some form of chemical treatment before the gasoline can be marketed. This chemical treatment is necessary in order to remove undesirable gum forming compounds, improve the color, reduce the sulfur content, improve the odor, and to increase the stability of the gasoline in storage or to sunlight. Although there are several different treating methods in use today, the sulphuric acid method has proven to be the only process which is generally adaptable to most types of cracked distillates.

Considerable work has been done on the acid treating of cracked distillates. Among the earlier articles which appeared on the subject was "Refining Cracked Distillate Vs. Light Oils," by Jacque C. Morrell and Gustav Egloff[2]. In this article the authors report the results of treating cracked distillates from widely different charging stocks. Variable conditions of treatment were also studied and they found that 66° Be. sulfuric acid was the most suitable concentration for treating purposes. They also reported that light had some effect on the treatment of cracked distillates but could be disregarded as light factors do not enter to any appreciable extent in practical treating. Among the other phases touched upon were the mechanical arrangements for treating, by-product recovery and an interpretation of the "Doctor Test."

Egloff and Morrell have given an excellent summary of the action of sulfuric acid on various hydrocarbons.

Jacque C. Morrell in a later article[3], states that cracked distillates contain four major groups of hydrocarbons; namely, the unsaturated, aromatic, naphthene, and paraffin hydrocarbons. Aromatic hydrocarbons were found to be soluble to a considerable extent in sulfuric acid of eighty per cent concentration and over. He found that the solubility of the aromatic hydrocarbons increases with increase in the molecular weight of the series. He also found that the lower members of the naphthene series reacted with concentrated sulfuric acid. The paraffin series, with the exception of methane react with sulfuric acid containing high percentages of sulfuric trioxide and the solubility increases with the percent of sulfur trioxide and increased temperature.

In the same article, it was cited that sulfuric acid reacted with olefins to give alcohols, esters, polymers and oxidation products. The extent of these reactions was found to be a function of the molecular weight and structure of the olefin as well as the concentration of the acid. Polymerization was found to increase with increase in strength of acid to a maximum of 91% acid.

Pierce[4] states that better color and less formation of sulfur compounds is obtained when the distillate is contacted with acid from three to five minutes. It was found that better color was attained and that acid formation in the rerun still was reduced when using 20% steam in the rerunning operation. Low temperature treats were found to give better color and less formation of acid compounds while high temperature treats gave a lower sulfur content. An increase in settling time increased the formation of acid compounds and improved the color but had little or no effect on the sulfur content.

POTHOFF[5] found that with increase in quantity of acid used there is also an increase in solution and polymerization losses. Gum content was decreased with increasing amounts of acid. He also found that the octane rating of the finished gasoline decreased with increase in quantity of acid. Increase of contact time between acid and distillate decreased the gum content but lessened the color and increased losses.

Bespalov[6] states that the

*A contribution from the Petroleum Research Laboratory of the University of Tulsa.

[1]Director of Petroleum Research, University of Tulsa.

[2](The Refiner and Natural Gasoline Manufacturer, Vol. II, No. 7, July, 1923).

[3]"Refining Petroleum Distillates," (NATIONAL PETROLEUM NEWS, Dec. 17, 1930 to Jan. 21, 1931).

[4](Nat. Pet. News 22 (46) 121 (1930)

[5](Oil and Gas Journal 29 (42) 141 (1931)

[6]Chem. Abs. 24, 1731 (1930).

greater the strength of the acid used in treating the greater will be the formation of polymerization products. It was also found that distillates heated during treatment yield less polymers.

Numerous patents have been granted for various treating processes. For a summary of the more recent patents, the reader is referred to The Cracking Art in 1930-1931[7].

Among the more recent articles published on this subject, there appears the "Acid Treatment of Cracked Distillates Involves Many Factors."[8] The following conclusions were based on experimental data obtained by processing a large sample of cracked distillate obtained by cracking the residue of a mixture of Smackover and Winkler County crudes under 300 pounds pressure and 900° F. coil outlet temperature:

I. Effect of time of agitation during acid treatment.

1. The longer the time of agitation, the greater the reduction of sulphur.

2. Too long agitation gives a poor color on the rerun gasoline.

3. The longer the agitation, the greater the amount of acid formed at rerun stills.

II. Effect of amount of steam used in distillation.

1. The more steam used the better the color on the rerun overhead.

2. The amount of steam has very little effect on the sulphur content of the rerun overhead.

3. An increase in steam decreases the amount of acid formation at the rerun stills.

III. Effect of storage time before rerunning.

1. A storage time of one day or more before rerunning improves the color on the rerun gasoline.

2. Sulfur content is not affected by storage.

3. Storage time before rerunning reduces formation of acid at the rerun stills.

IV. Effect of water wash before caustic neutralization.

1. A water wash before caustic neutralization does not affect the acid formation at the rerun stills.

2. A water wash lowers the sulphur content slightly on the rerun gasoline.

3. A water wash does not affect the color of the rerun gasoline.

V. Effect of caustic wash.

1. A caustic strength higher than 2 Be is preferable. However, any strength above 4 Be will give the same results at the rerun stills on sulfur, color and acid formation.

VI. Effect of temperature of acid treatment.

1. A low temperature treatment gives the same color as a high temperature treatment.

2. The acid formation at the rerun stills is markedly less on the distillate treated at a low temperature than on the distillate treated at a high temperature.

3. The sulfur is slightly lower on the distillate treated at a high temperature.

VII. Effect of settling time.

1. Prolonged settling time before caustic neutralization markedly increases the acid formation at the rerun stills.

2. Prolonged settling time tends to affect the color on the rerun overhead.

3. Prolonged settling time lowers the sulfur slightly on the rerun gasoline.

The same author in a later paper treats[9] on the advantages and disadvantages of acid treatment.

Trusty summarized the advantages of sulfuric acid treatment as:

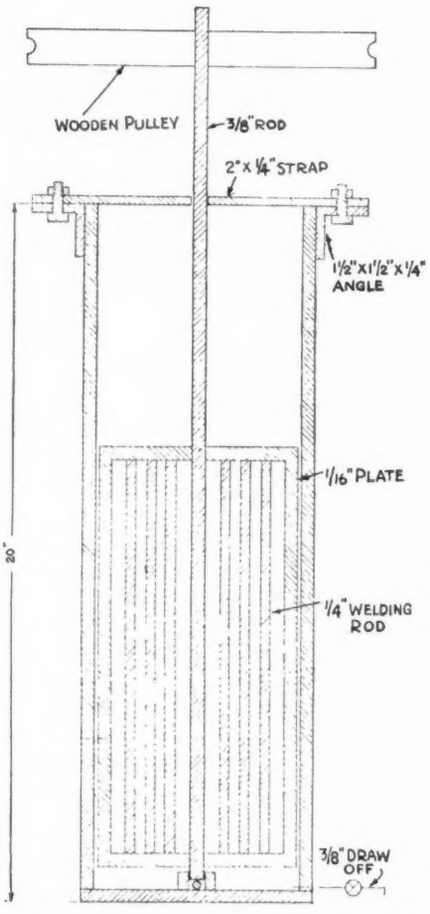


Fig. 1—Details of Experimental Agitator employed in sulfuric acid treatment study

1. Good color can be obtained with almost any type of cracked distillate.

2. Gum can be reduced to any practical specification.

3. Sulfur content can be reduced considerably.

4. The odor can be improved remarkably.

5. Stability to sunlight is markedly increased.

He gives the following disadvantages:

1. Treating loss.

2. Loss in knock rating.

3. Acid formation on rerunning.

Harmful gum is defined by R. C. Conine[10] as being the resinous or viscid matter whose appearance in cracked gasolines portends clogged motor fuel lines, fuel pumps, carburetor valves, and which later is found on the sufaces of manifold valves, and cylinders of the automobile engine in the form of a hard black deposition which will eventually affect its operation. Arch L. Foster[11] gives a review of the literature pertaining to gum and gum formation in gasolines:

Various theories have been proposed to account for the formation of gums in cracked gasolines. Smith and Cooke[12] suggested that gum formation was due to the condensation of aldehydes or other oxidation products with olefins and polyolefins. Brook[13] found that the addition of readily oxidizable hydrocarbons increased gum formation. Yule and Wilson[14] suggested that peroxide formation was a step in formation of gum.

With the increase in severity of cracking conditions, gum content, color, and color stability, and preservation of octane rating have become important factors in the manufacture of commercial gasolines from cracked distillates.

It has been generally believed that poor color and color stability result from chemical changes of the more highly unsaturated hydrocarbons such as the diolefins. Factors which

[7]Gustav Egloff, Badona L. Levinson and Margaret Herrman) Jour. Inst. Pet. Tech., April 1932.

[8]A. W. Trusty (Refiner & Natural Gasoline Manufacturer Vol. II, No. 8, Aug. 1932, P. P. 455-457)

[9]"Role of Sulfuric acid in the Treatment of Pressure Distillates" (Refiner and Gasoline Manufacturer Vol. II, No. 12, P.P. 604, 605, and 610, Dec. 1932)

[10]("Inhibitor Keeps Gum Out of Gasoline, Anti-Knock Value in"—Oil & Gas Journal, November 24, 1932)

[11](Treating Light Distillates—NATIONAL PETROLEUM NEWS, Jan. 18, 1933, P.P. 34-36)

[12](U. S. B. of M. R. I. 2394 (1932)

[13](Ind. Eng. Chem. 18, 1198 (1926)

[14](Ind. Eng. Chem. 23, 1254 (1931)

favor gum formation are light, heat, and oxidizing agents.

Gustav Egloff, W. F. Faragher, and J. C. Morrell (How Some Inhibitors Affect Knock, Rating, Gum, and Color in Cracked Gasolines) state that the decomposition of acid esters and the reaction products of sulfuric acids are sometimes responsible for undesired color in gasolines. Although color is a function of the treating operation, it is also a function of the rerunning operation. It has been found that if the fractionating facilities are adequate, good color can be obtained on almost any type of cracked distillate which has been properly treated.

Experimental Work

From the preceding abstracts one can readily see that the acid treatment of pressure distillates has been investigated in a very thorough manner. It is also evident that practically none of these articles touches upon the effect of acid treatment on the octane number of the distillate in question. It is, then, the purpose of this paper to show the relationships existing between the sulfuric acid treatment and the octane ratings of various types of pressure distillates.

Although this paper deals mainly with the effect of acid treatment upon octane rating, some interesting data were obtained pertaining to other important factors of treating. These factors are gum, color, and color stability.

The samples of pressure distillate used in this work were obtained from three different refiners. Each pressure distillate represents a different type of commercial cracking process.

The laboratory treats were carried out as follows:

Two liters of well stabilized pressure distillate from the commercial cracking unit was placed in a glass stoppered heavy walled bottle and the required amount of sulfuric acid from a calibrated burette was added. A considerable amount of work was carried out to determine the optimum time of agitation and we found under the conditions of our experiments five minutes was the best time of agitation; that is, under these conditions we obtained

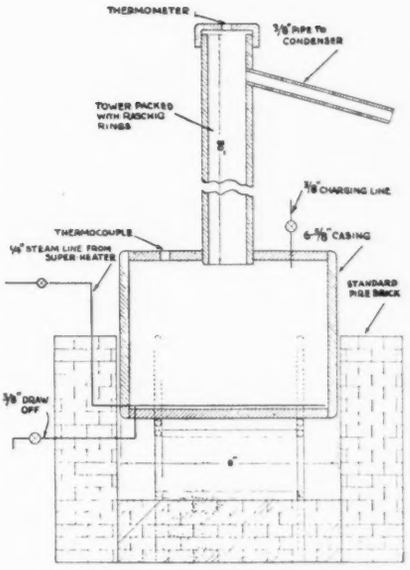


Fig. 2—Experimental fractionating still employed in treating research

the best color, least gum, and less drop in octane value. This part of our experimental work confirms the observations of other writers previously cited. The agitation was carried out by shaking the bottle vigorously by hand for five minutes as timed with a stop watch.

In order to determine whether there would be any advantages to mechanical agitation over the method given we built a small mechanical agitator, sketch of which is shown herewith (Fig. 1). This agitator was built out of a piece of 5 3/16-inch pipe with a bottom draw-off and mechanical agitator revolved by means of a belt driven pulley. We found no difference between the mechanical agitation and the hand agitation, other than we had a slight vapor loss in the mechanical type agitator which we did not have in the closed bottle system.

After the agitation was completed the oil and acid were allowed to settle for one hour. This period was determined as the optimum period by a series of experiments by which we varied the time from 15 minutes to as high as 24 hours time of settling. We found that the longer periods of settling gave us higher gum contents probably due to the formation of acid esters and their resulting decomposition product. The clear oil was decanted from the acid sludge, transferred to a clean dry bottle and neutralized with 12 Be'. caustic soda solution. After thorough agitation, the oil was then water washed. The water washed product was allowed to settle and was rerun in a laboratory still having a fractionating column. This still was the outcome of a series of experiments and we are showing herewith a cut giving its dimensions in detail. (Fig. 2).

It was found that this still, when properly operated, gave a very close cut; for instance, when running dry without steam a tower temperature of 374° would give us an end point of 376°. However, in all our experiments the pressure distillate was rerun with steam, the amount of steam being controlled by the temperature of the bottom of the still.

An iron-constantan couple, connected to a millivolt meter and carefully calibrated was used to measure temperatures at the bottom of the still. An A. S. T. M. low distillation thermometer was used to measure the temperature of the vapors. Steam was generated in a boiler and superheated through a small superheater coil before passing into the still. The distillattion was started without steam and no steam was admitted until the bottom temperature had reached 250° F. The still was then fired with gas and steam gradually added until the desired end point was obtained on the distillate. In no case was the bottom temperature allowed to exceed 350°F.

The still was controlled to give distillates having exactly the same boiling range from each series of pressure distillates. This had to be carefully controlled or else the octane values obtained would have been of little value. In all distillations, approximately 1% of soda ash was added to the charge to prevent decomposition of sulfonic acids. The pressure gasolines thus obtained were sweetened with doctor solution in the customary way and the various tests, such as A. S. T. M. distillation, color, copper dish gum, color stability and octane value were then determined.

All tests were determined in accordance with standard A. S. T. M. methods. The octane values were determined on a

Table 1

Pressure Distillate A-Treated With 66° Be H_2SO_4

Treat	I. B. P.	E. P.	Color After 3 Hours Exposure To Sun Color	Octane No.
0	115	408	10.5 —8	70
1	117	408	19 9+	68.9
2	117	408	25 20	68.2
3	117	408	29+ 27	67.7
5	118	408	30+ 30+	67.1

Table 2

Pressure Distillate A-Treated With 62.5° Be. H_2SO_4

Treat	I. B. P.	E. P.	Color After 3 Hours Exposure To Sun Color	Octane No.
0	116	408	10.5 —8	70
1	117	408	18 8+	69
2	117	408	24 19	68.3
3	117	408	28 26	67.8
5	117	408	30+ 30	67.3

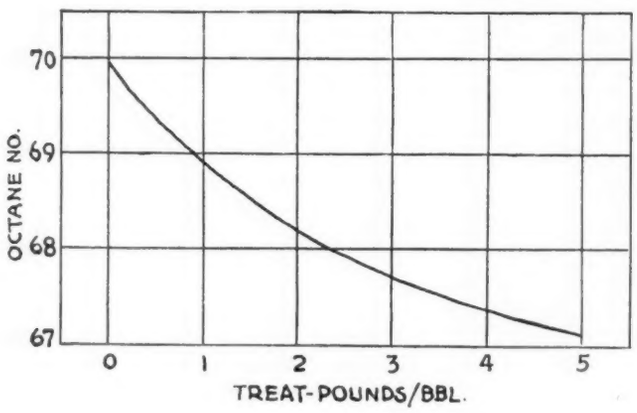
series 30-B Ethyl engine using a jacket temperature of 212°F. and a spark advance of 15° and using standard reference fuels A and B. On account of the large number of experiments carried out, we have been forced to condense the experimental work by summaries and tabulating the most important factors of this work and the following tables and graphs embody the most important data obtained.

In Table 5 we show the results of a set of experiments carried out to show the effect of acid treatment on the reduction in sulfur content in pressure distillate made from a high sulfur cracking stock. This particular pressure distillate was obtained by cracking a distillate from Healdton crude oil.

The sulfur compounds usually present in a distillate of this type are hydrogen sulfide, free sulfur, mercaptans, disulfides, sulfides, and thiophenes. As all commercial pressure distillates high in sulfur are washed with caustic soda to remove the hydrogen sulfide before acid treatment, it will not be necessary to discuss the action of sulfuric acid on hydrogen sulfide. This preliminary treatment is necessary to prevent any oxidation of hydrogen sulfide to free sulfur.

Disulfides and sulfides present in petroleum distillates of this type when treated with sulfuric acid are removed both by solution and by oxidation. The oxidation products are usually soluble either in water or caustic soda and removed by the subsequent neutralization. Thiophenes are converted to sulfonic acids and the sulfonic acids and their alkali salts are somewhat water soluble and can be removed in this way. Mercaptans are oxidized to disulfides and these as mentioned above are further oxidized. No other method of treatment is so effective in reducing the sulfur content of high sulfur distillates as acid treatment and it is only by the use of this method of treatment that stable commercial products can be obtained.

There has been an impression



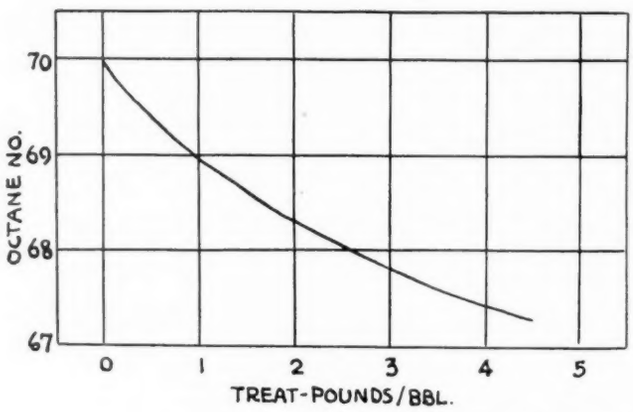


Fig. 3—Graphical analysis of data in Table 1

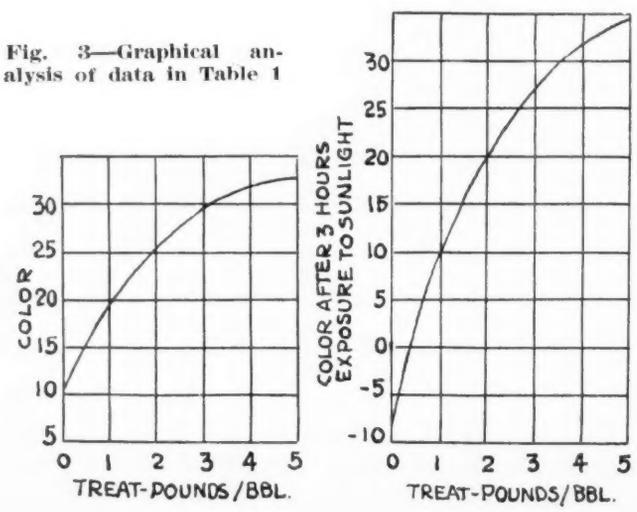


Fig. 4—Graphical analysis of data in Table 2

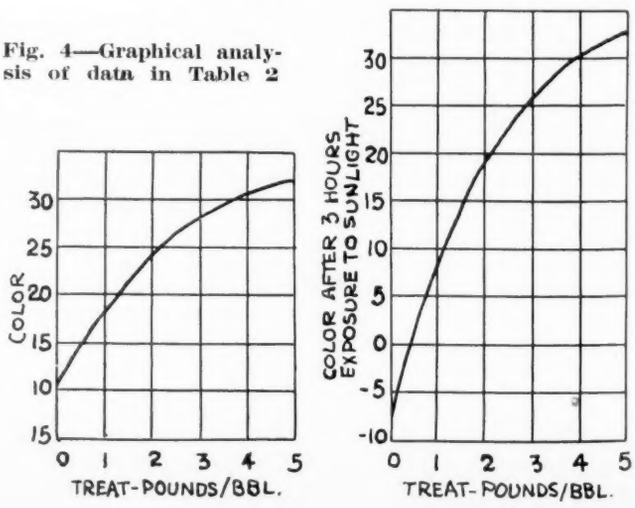


Table 3

Pressure Distillate B-Treated With 66° Be. H_2SO_4

Treat	I. B. P.	E. P.	Color After 3 Hours Exposure To Sun	Octane No.
0	109	411	16	6	68.5
1	110	411	22	18	67.3
2	110	411	27	25	66.6
3	110	411	30	29	66.2
5	111	411	30+	30+	65.8

Table 4

Pressure Distillate B-Treated With 62.5° Be. H_2SO_4

Treat	I. B. P.	E. P.	Color After 3 Hours Exposure To Sun	Octane No.
0	109	411	16	6	68.5
1	110	411	21+	17	67.4
2	110	411	26	23+	66.8
3	110	411	29	27	66.4
5	110	411	30+	30+	65.9

among a few refiners that acid treatment of pressure gasolines seriously depreciates the octane value. Our experimental work proves that this is not the case.

In all cases commercial samples of gasoline from the same plants were compared with the laboratory tests and in general they checked very closely with the exception that the plant samples usually had a lower initial boiling point and a better octane rating than the laboratory treated samples. This is easily accounted for by the fact that laboratory samples are always subjected to considerable loss in evaporation through handling.

The results of these experiments show that there is an improvement in color, in color stability, and in gum removal with an increase in the amount of acid used for the treat. The octane rating decreases slightly with an increase in the amount of acid used. There is an optimum concentration of acid for each particular type of pressure distillate to obtain the maximum color stability and gum removal with the least decrease in octane rating.

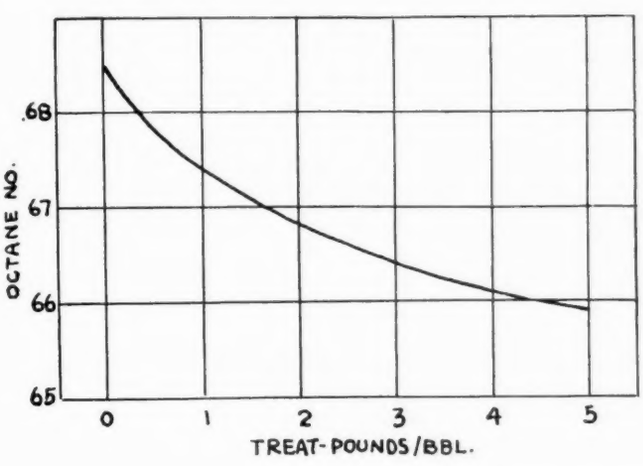
Table 5

Pressure Distillate C-Treated With 66° Be. H_2SO_4

Treat	I. B. P.	E. P.	Color	Color After 3 Hours Exposure To Sun	Octane No.	Sulfur
0	119	410	—1	—9	67.4	.18
2	120	410	14+	8	66.1	.16
3	120	410	20	15	65.7	.12
5	120	410	27	25	65.1	.07
7	120	410	30+	30+	64.7	.04

Excessive amounts of acid, beyond the amount required, result in poorer colors and excessive loss in octane rating. Very little difference could be noted between the treats using 62.5 Be'. acid and 66° Be'. acid.

Experiments carried out in the laboratory indicated that



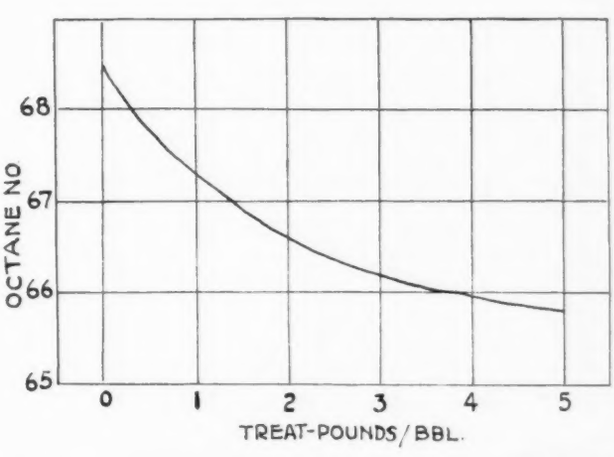


Fig. 5—Graphical analysis of data in Table 3

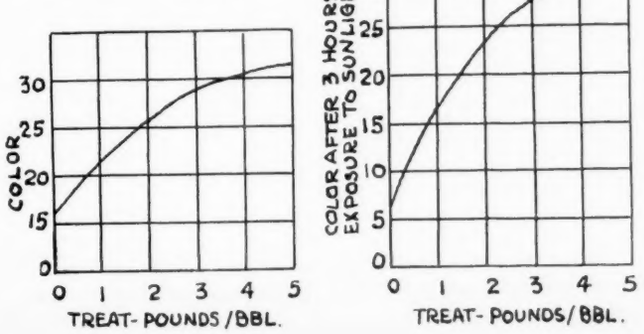
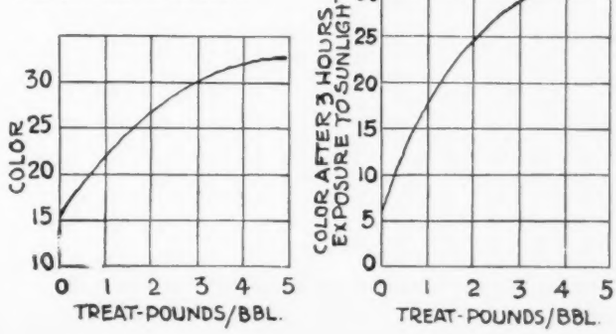


Fig. 6—Graphical analysis of data in Table 4



the use of fuming acid was undesirable, resulting in poorer colors and lower octane ratings.

We have found that both by laboratory tests and by practical plant treats that from ¾ of a pound up to 3 pounds per barrel of 66° acid will give rerun pressure gasolines having good color, and good color stability, gum contents by copper dish of less than 10 mg. and that the octane ratings of such gasolines in no case were more than two points lower than an untreated distillate of the same boiling range.

In the case of high sulfur distillates, slightly larger amounts of acid were required to bring the sulfur content below 0.1%. Comparison of the color stability and gum content of acid treated distillates and those treated by other processes generally showed a much lower gum content and a much better color stability for the acid treated distillates.

In general, we have found that with proper modifications, sulfuric acid treatment can be used for almost any type of pressure distillate and when used under proper conditions of time, temperature, and concentration will give pressure gasolines having good color and good color stability low gum content and very little loss in octane rating.

May Offer Licenses At Early Date

TULSA, April 1.—Persistent rumors say that negotiations between the Petroleum Distillation Corp. and interested refiners have progressed to a point where a statement from the former outlining in detail its position as to royalties and license provisions for operation of refining distillation processes under its patents will be made public in the near future.

This company holds the refining patents pooled by Standard Oil Co. of New Jersey, Standard Oil Co. of Indiana, Atlantic Refining Co. and Foster Wheeler Co. Because of alleged infringements of these patents, more than 150 in number, dealing with practically every important phase of refinery distillation, months of intensive study of the problem have been devoted to the problem by the legal departments of both the P. D. C., as it is known colloquially, and of the larger refiners, in the effort to reach a thorough understanding of the situation, and to form as basis of license and agreement which would be fair to all concerned.

For a time friendly suits were contemplated, to determine the validity of various patents, and the actuality of infringement of them by refiners. It is reported however, that mature deliberation and study of the matter has led those involved to the conclusion that these suits may best be avoided, and that a proper basis of license may be arrived at in the near future without litigation.

Correction

In an article by R. K. Stratford, H. H. Moor and O. S. Pokorny on the "Use of Phenol as a Selective Solvent in Refining Lubricating Oils" in the March 29 issue a typographical error was made in Table 2. The minus sign was omitted from the pour point of "Marvelube Ten." The correct pour point of this oil is minus 25F. Pour points of other oils in the table were correctly given.

In Table 6 giving operating costs daily water requirements are stated in thousands of gallons and not in gallons as the table indicates.

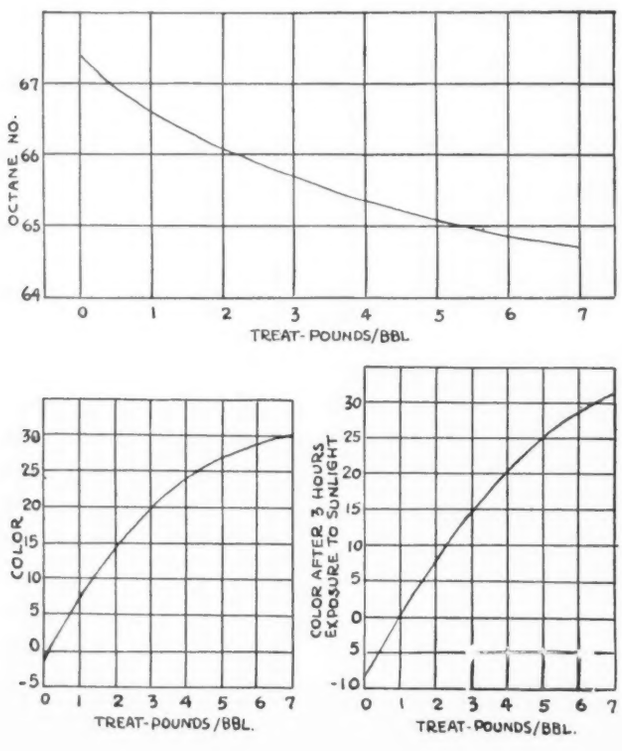
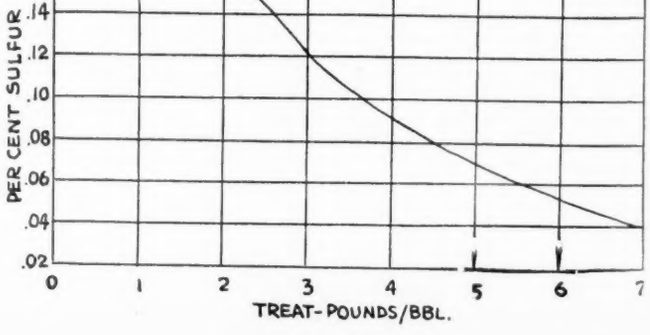


Fig. 7—(left) Graphical analysis of data in Table 5

Fig. 8—(below) Effect of sulfuric acid treatment on high sulfur distillates



"Gum Inhibiting Index" Shows Efficiency of Inhibitor

By W. W. Scheumann*

(Presented before Western Petroleum Refiners Association, Hot Springs, Ark., April 5-6)

THE existence of several types of gum has been well established. Among these, two distinct types are recognized; namely, preformed and potential gum forming materials. Preformed gum is the residue which is obtained on rapid or non-oxidizing evaporation of the gasoline, and represents a polymerized product obtained from unstable oxidation products in the gasoline.[1] It is this type of gum which results in a gum deposition in the engine when fuel containing it is used.[2]

Gasoline when freshly refined contains little or no preformed gum; however, it may contain materials capable of reaction with oxygen under storage conditions. These are termed potential gum forming materials, in that if given the opportunity they will form gum. The refiner's problem therefore consists of preventing or minimizing the transformation of potential gum forming materials to preformed gum.

Stabilization of Gasoline

Obviously, the simplest method of stabilization of cracked gasoline would consist of the complete removal of all the potential gum forming substances. However, to be economically feasible this would require that no desirable constituents be simultaneously removed. Since the gum forming constituents differ from other desirable non-gumming constituents only in their degree of unsaturation, it is recognized that this separation can only be effected with difficulty.

Several methods have been advocated for the accomplishment of this, among which are hydrogenation and certain vapor phase treating methods. Hydrogenation accomplishes this by the addition of hydrogen to the more unsaturated constituents, changing them to a more saturated non-gumming form of hydrocarbon, while vapor phase treating polymerizes these materials to a form in which they can be removed by physical means without affecting the simpler olefinic or aromatic compounds.

While the use of such treating methods is gaining in favor, they are not extensively used as yet and sulfuric acid treatment still remains almost the universal treating process. Sulfuric acid is a powerful but not very discriminating reagent. Therefore, if it is used in quantities sufficient to remove all potential gum forming materials it also removes valuable anti-knock producing constituents which the refiner wishes to keep in his product.

*Empire Oil and Ref. Co.

In order to prevent this it is necessary that only sufficient acid be used to effect the removal of the most highly unsaturated and reactive materials. Gasolines so treated can then be satisfactorily stabilized for storage by the use of gum inhibitors, and retain thereby their desirable anti-knock properties as well as freedom from harmful gum formation for the desired storage period.

Gum Inhibitors

Gum inhibitors are reagents which when added to the gasoline in very minute quantities effectively prohibit, or at least postpone, the formation of gum. A comparatively small amount of information is actually available on this subject. However, a considerable amount of data have been published on the theoretical side of anti-oxidant action or "negative catalysis" of autoxidation. Egloff and others[3] have extracted from the literature numerous facts which are helpful in understanding the mechanism of inhibiting gum formation, and show that the power of preventing the action of free oxygen on sensitive materials is largely possessed by substances which are themselves readily

Table 1

Results Obtained on Typical Inhibiting Materials

Inhibitor*	Concentration mg. / 100 cc.	Potential Gum mg. / 100 cc.		Reduction of Potential Gum Per cent
		Treated Sample	Untreated Sample	
Anthracene	1.0	340	352	3.4
Anthracene	2.0	246	352	30.2
Anthracene	5.0	208	352	40.8
Anthraquinone	1.0	722	460	—57.0
Benzaldehyde	2.0	245	352	30.4
Benzidine	1.0	390	460	15.2
Inhibitor No. 1	0.5	45	329	86.3
Inhibitor No. 1	3.6	3	329	99.0
Inhibitor No. 2	0.5	294	329	10.6
Inhibitor No. 2	3.6	23	329	93.0
Inhibitor No. 3	0.5	2	329	99.3
Inhibitor No. 3	1.0	2	329	99.3
Inhibitor No. 4	1.0	2	329	99.3
Inhibitor No. 4	2.0	133	301	55.8
Dibenzyl-para-aminophenol	1.0	321	600	46.5
Dibenzyl-para-aminophenol	3.6	8	600	98.7
Dibenzyl-para-aminophenol	2.0	1	352	99.8
Monobenzyl-para-aminophenol	0.5	2	392	99.4
Monobenzyl-para-aminophenol	1.0	9	420	98.0
Monobenzyl-para-aminophenol	1.5	2	420	99.6
Alpha-Naphtholamine	2.0	80	352	72.3
Alpha-Naphthol	1.0	7	184	96.0
Alpha-Naphthol	1.0	1	352	99.6
Alpha-Naphthol	1.5	55	420	87.0
Pyrocatechol	1.0	5	301	98.6
Pyrocatechol	1.0	1	352	99.6
Inhibitor No. 5	5.0	5	121	96.0
Inhibitor No. 5	10.0	2	121	98.8
Inhibitor No. 5	5.0	13	452	97.3
Inhibitor No. 5	10.0	2	452	99.7

*Inhibitors Nos. 1-5 inclusive are commercial gum inhibitors sold under trade names.

Table 2

Comparative Average Gum Inhibiting Indices

Position	Inhibitor	Inhibiting Index
1	Monobenzyl-para-aminophenol	157
2	Inhibitor No. 3	150
3	Inhibitor No. 1	99
4	Dibenzyl-para-aminophenol	84
5	Pyrocatechol	75
6	Alpha-Naphthol	63
7	Inhibitor No. 4	57
8	Alpha-Naphtholamine	36
9	Inhibitor No. 2	33
10	Benzaldehyde	15
11	Benzidine	15
12	Inhibitor No. 5	15
13	Anthracene	9
14	Anthraquinone	—57

oxidized. Generalizations, however, can only be made with caution, as it has been claimed that, depending on conditions, a substance may act as either an anti-oxidant or a pro-oxidant toward a single second substance, and that a substance may be an anti-oxidant for one material and a pro-oxidant for another.

Oxidation of petroleum products, such as cracked gasoline, does not occur at a constant rate. When a fresh gasoline is exposed to oxygen or air a time period elapses before any appreciable oxidation or gum formation occurs. This time period is known as the induction period and is a function of not only the nature of the gasoline and its previous chemical treatment, but also of storage temperature, oxygen pressure and the presence or absence of catalytic agents.

After the induction period has been exceeded, oxidation occurs at an accelerated rate, the reaction apparently being self-catalyzed or catalyzed by the products of reaction. This, as well as the action of a typical inhibitor, is illustrated in Figure No. 1.

Oxidation inhibitors act solely on gasoline by extending the induction period. They do not as a rule have any effect on gum formation once the induction period has been exceeded. However, by this means the safe storage life of the gasoline may be increased and the objective desired obtained.

The literature indicates that practically all classes of organic compounds have been examined for their inhibiting properties and that a relatively large number of materials possess such properties. However, for commercial use it is necessary that factors other than gum inhibition also be considered, as it is entirely possible that a substance might be satisfactory in this respect but entirely unsuited to be added to gasoline from another. Among such factors may be mentioned:

a. Gum inhibiting properties

b. Effect on color

c. Effect on color stability

d. Solubility in water and in hydrocarbons

e. Octane number stabilizing properties

f. Cost

Table 3

Economic Grading of Gum Inhibitors

Inhibitor	Inhibiting Index	Price per Pound	Economic Factor
Alpha-Naphthol	63	0.60	0.010
Inhibitor No. 5	15	0.25	0.017
Monobenzyl-para-aminophenol	157	3.10	0.020
Dibenzyl-para-aminophenol	84	1.98	0.024

Table 4

The Effect of Gum Inhibitors on Color and Color Stability

Inhibitor	Concentration mg. / 100 cc.	Initial Color Saybolt		Color After 5 Hrs. Sunlight		Color Loss	
		Treated Sample	Untreated Sample	Treated Sample	Untreated Sample	Treated Sample	Untreated Sample
Monobenzyl-para-aminophenol	1.0	30+	30+	30	30+	0	0
Monobenzyl-para-aminophenol	1.0	25	25	23	23	5	5
Dibenzyl-para-aminophenol	1.0	30+	30+	27	30+	3	0
Dibenzyl-para-aminophenol	4.0	29	30+	21	30+	9	0
Dibenzyl-para-aminophenol	6.0	25	30	17	23	8	7
Dibenzyl-para-aminophenol	8.0	22	30	12	23	10	7
Pyrocatechol	2.0	30+	30+	30	30+	0	0
Pyrocatechol	1.0	25	25	23	23	0	0
Inhibitor No. 4	1.0	30+	30+	pink	30+	*	0
Inhibitor No. 4	2.0	30+	30+	pink	30+	*	0
Inhibitor No. 5	10.0	30+	30+	30+	30+	0	0
Inhibitor No. 5	20.0	30+	30+	30+	30+	0	0
Inhibitor No. 5	30.0	30+	30+	30+	30+	0	0
Inhibitor No. 5	10.0	30+	30+	22	19	8	11
Inhibitor No. 5	20.0	30+	30+	23	19	7	11

*Unsatisfactory.

Table 5

Comparative Average Color Stability Indices

Inhibitor	Color Stability Index
Inhibitor No. 5	0.19
Pyrocatechol	0.00
Monobenzyl-para-aminophenol	0.00
Dibenzyl-para-aminophenol	—1.03
Alpha-Naphthol	—4.50
Inhibitor No. 4	Unsatisfactory

Examination of Gum Inhibitors

In conducting an investigation concerning the suitability of inhibiting materials for commercial use the first requisite is naturally a determination of inhibiting effectiveness. This may be carried out in several manners, but the following method has been found to be quite satisfactory. It is based upon the reduction of the potential gum value by the inhibitor.

This value is determined in accordance with the method specified by the U. S. Bureau of Aeronautics for aviation gasoline. It consists of placing the sample in an unstoppered glass bottle which is then inserted in a suitable steel bomb. Oxygen is forced into the bomb until a pressure of 100 pounds per square inch is obtained and it is then placed in a thermostatically controlled bath held at a temperature of 212° F. for four hours. The preformed gum content is then determined on the oxidized sample by the air-jet method in accordance with Method A as shown in the D-2 Committee report of the A. S. T. M. for 1932. The potential gum value is the difference between the gum content of the oxidized sample and the original material.

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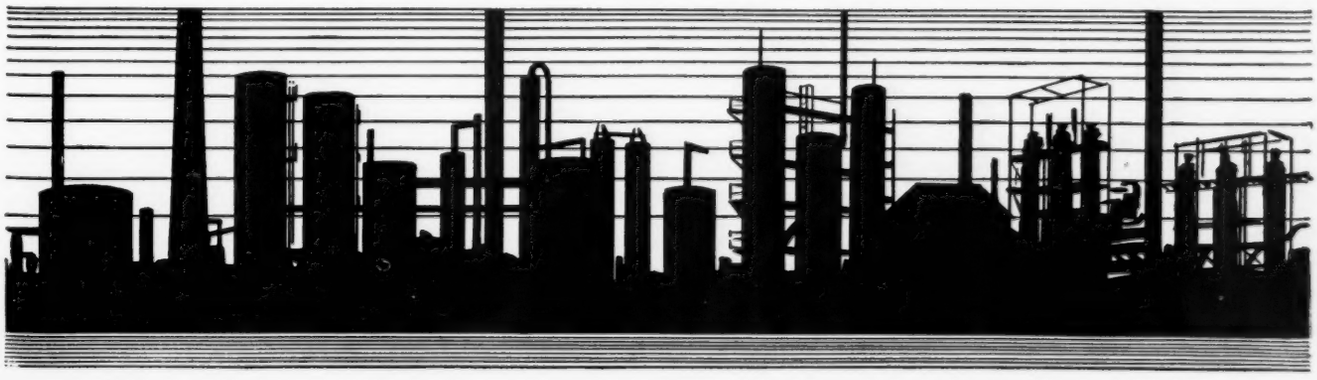

Results Obtained on Typical Inhibiting Materials

In order to correlate the previous data and compare directly the gum inhibiting action of the various materials, a gum inhibiting index has been used which is calculated as follows:

$$\text{G. I. Index} = \frac{\text{Average Per Cent Potential Gum Reduction}}{\text{Average Concentration of Inhibitor mg./100 cc.}}$$

As the completion of a large number of potential gum determinations requires a considerable period of time, they cannot all be made on the same gasoline samples, as would be most desirable, since the properties of such samples change with age. It is necessary therefore that a considerable number of such determinations be made with each inhibitor in order to arrive at a representative average value when different gasoline samples are used.

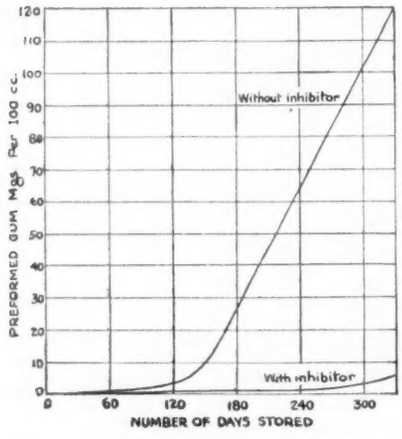

Fig. 1—Effect of Pyrocatechol on formation of preformed gum in gasoline

In Table 2 are shown the gum inhibiting indices ranged in decreasing order, based on a large number of determinations not included in this paper.

A further calculation may be made using the inhibiting index and the price of the inhibitor, evaluating thereby the efficiency of the inhibitor from a cost standpoint. This is obtained by dividing the cost price per pound by the inhibiting index. Results of such a comparison on several inhibitors is shown in table No. 3.

The effect of the inhibitor on the color of the gasoline may be noted by simple inspection of the gasoline before and after treatment in accordance with method D156-23T of the A. S. T. M.

For evaluation of the effect on color stability, however, no standard method exists, and again there are several means of making such determinations which might be satisfactory. Color stability tests have been made by the following method, which seems to give consistent values.

The samples are exposed in chemically clean four-ounce bottles to the action of sunlight for a period of five hours. The samples are placed in a rack, which is painted white for maximum reflection, and so located that no shadows will be cast upon it during the test period. The tests were carried out from 10 a. m. to 3 p. m. only on such days when the sky was practically free of clouds. The color loss is the difference in Saybolt color before and after exposure. In Table 4 is shown the action of typical inhibitors in this respect.

Of the previously mentioned inhibitors the only one which appears to affect the initial color is dibenzyl-para-aminophenol, the color loss being a function of the concentration and the gasoline being treated. Actually, additions of this material to gasoline change the cast more than the color concentration, causing the formation of a brownish cast. When tested on the Saybolt apparatus, however, this change in cast penalizes the color of the gasoline.

Apparently, however, this color effect is not noticeable at concentrations below 2 mg. per 100 cc., which is sufficient for the usual liquid phase cracked gasoline.

However, the data in Table 4 indicate that several of these inhibitors have a considerable effect on color stability. In order to compare this property a color stability index has been calculated from these data as follows:

$$\text{Color Stability Index} = \frac{\text{Color Loss Untreated Sample—Color Loss Treated Sample}}{\text{Concentration of Inhibitor mg./100 cc.}}$$

The average value of this index for various inhibitors is shown in Table 5. These values are based on a considerably larger amount of data than are shown in this paper.

Positive values of this index indicate color stabilization, while negative values indicate acceleration of color formation. On white gasoline this is of considerable importance, as in many cases color stability of cracked gasoline is a considerable problem in itself.

Since it is virtually impossible to prevent contact of some water with gasoline under all conditions, the relative solubility of an inhibitor in these two media is of importance. An inhibitor which is highly soluble

(*Continued on page 72*)

Table 6

Comparative Solubility Values

Inhibitor	Solubility Water	mg./100 cc. Gasoline	Solubility Ratio
Inhibitor No. 5	Insoluble	100%	
Alpha-Naphthol	Insoluble	564	
Inhibitor No. 4	4.3	252	58.7
Dibenzyl-para-aminophenol	4.6	54.8	11.9
Monobenzyl-para-aminophenol	56.5	51.7	0.92
Pyrocatechol	45,100	52.5	0.0012

Table 7

Stabilization of Octane Number

Inhibitor	Concentration mg/100 cc.	Before Oxidation Preformed Gum	Before Oxidation Octane Number	After Oxidation Preformed Gum	After Oxidation Octane Number
None	...	1.0	70.0	184	60.0
Alpha-Naphthol	1.0	1.0	70.0	7.3	68.0
Pyrocatechol	1.0	1.0	70.0	1.2	69.0
Inhibitor No. 5	2.0	1.0	70.0	8.3	64.0
Inhibitor No. 5	5.0	1.0	70.0	1.3	69.0

ADVERTISING PAGES REMOVED

Dichloroethyl Ether Used As Selective Solvent In Lube Manufacture

By J. M. Page, Jr.*
C. C. Buchler*
and S. H. Diggs*

(*Presented before American Chemical Society, Washington, D.C., March 26-31***)

IT IS generally agreed that the modern motor oil should show as little change in viscosity with temperature as possible and should deposit little or no engine carbon in use. The necessity for these requirements has been discussed by a number of authors (1) (3) (10) (13) (14) (17). An important addition to these requirements is resistance to oxidation or sludging (2) (15) (18). This latter has also been frequently discussed and it is the opinion of this laboratory that a motor oil should be highly resistant to oxidation and sludging.

It has been the effort of refiners to produce a line of motor oils which excel in all these important characteristics but up to now the available oils have been largely a compromise. Thus oils produced from Pennsylvania crude by ordinary methods of refining show excellent viscosity-temperature relationships and resistance to sludging but are handicapped by carbon forming tendencies.

On the other hand, oils of Gulf Coast origin have neither a satisfactory viscosity-temperature relationship nor do they exhibit good resistance to sludging, although they do have a very low carbon forming tendency.

Blends of these two extreme types of oil possess the properties of each in approximate accordance with the quantities used, but only result in a rather unsatisfactory compromise. Oils refined from mixed base crudes (e.g., Mid-Continent or Salt Creek) by the usual methods of sulfuric acid treatment, are, in general, similar to such blends, since the crudes contain oils of both types.

To meet the exacting requirements of the modern motor it has become necessary to develop new methods of lubricating oil manufacture. Hydrogenation of stocks deficient in this element has been definitely established upon a commercial basis (10). Actual synthesis of superior lubricants is a relatively recent development of this company (16). Following an exhaustive study of selective solvents (7) Ferris and Houghton describe the nitrobenzene extraction process (8), which is similar in its action to the Edeleanu Process (12) whereby the undesirable constituents of lubricating fractions are selectively extracted from the naturally occurring oils of high quality.

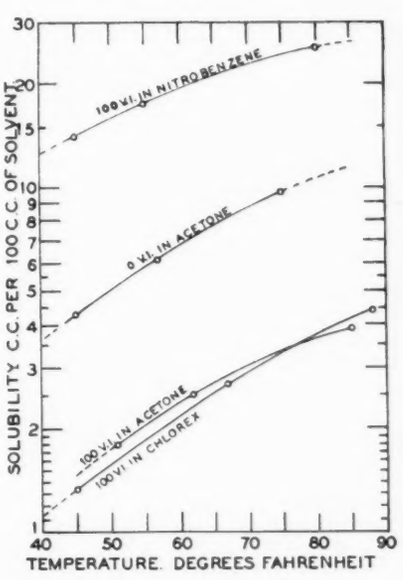

Fig. 1—Solubility of oils of 100 viscosity index and 0 viscosity index in chlorex, nitrobenzene, and acetone

This paper deals specifically with the production of lubricating oils by extraction of petroleum fractions with $\beta\beta$-dichloroethyl ether†, a non-poisonous, stable, and highly selective solvent now available in commercial quantities††.

Properties of $\beta\beta'$-Dichloroethyl Ether

For many years a selective solvent had been sought which would prove suitable for large scale use in separating the high and low grade constituents known to exist in all lubricating oils. Many selective solvents were found to be satisfactory from a research point of view, but wholly unsuited for plant scale usage, due either to their excessive cost, availability or to some unfavorable feature in their physical, chemical or physiological properties. A detailed investigation of $\beta\beta'$-dichloroethyl ether by this laboratory showed it to be a very selective solvent and its merit has been confirmed through plant scale usage.

$\beta\beta'$-Dichloroethyl ether (hereinafter termed "Chlorex") is a colorless liquid of ethereal and not unpleasant odor, having the properties shown in Table 1, most of which are quoted from Fife and Reid (9). Aside from the very desirable property of

*Research Laboratory, Standard Oil Co. (Indiana), Casper, Wyoming.

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†U. S. and Foreign patents pending.

††*BB'*-dichloroethyl ether sold by Carbide and Carbon Chemicals Corp. under the trademark "Chlorex."

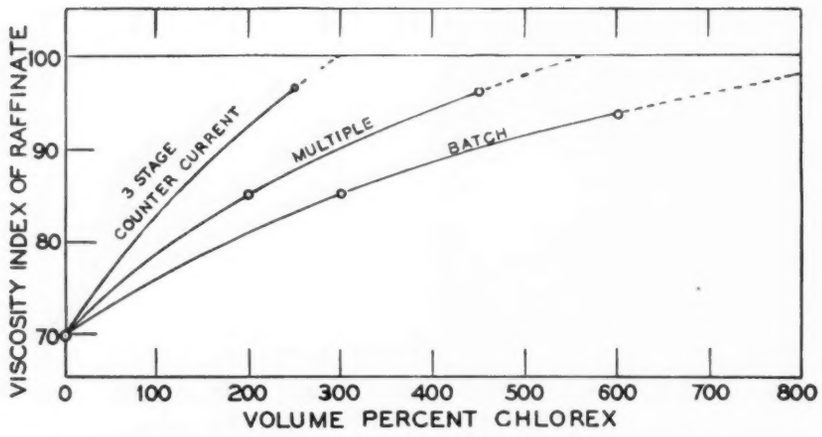

Fig. 2—Extraction of an S. A. E. 50 grade oil, showing relative amounts of chlorex required by several methods of extraction to produce an oil of given viscosity index

high selectivity, it is apparent that this solvent is particularly well adapted to plant scale usage. Its high specific gravity permits rapid and efficient separation of the two phases formed with oils. Its boiling point is well below the vaporization temperature of all grades of motor oil, while its low vapor pressure precludes the possibility of significant losses in storage. The freezing point of the material is so low that precautions in this respect are unnecessary.

Since extraction with Chlorex is ordinarily carried out within the temperature range of 30° to 80°F., it is apparent that its low viscosity at these temperatures is also a factor of importance. The flash point of the solvent is well above that normally considered hazardous for petroleum distillates. It is noninflammable at ordinary temperatures.

Although experiments conducted by the Bureau of Mines indicate that for equal concentrations in air, Chlorex is somewhat more toxic than carbon tetrachloride ([4]), this toxic concentration is appreciably higher than that which would be built up over liquid Chlorex at ordinary temperatures or under normal storage conditions. During the course of nearly one year's use of this material on plant scale, no cases of injury or sickness have resulted through its use.

Measurement of Viscosity-Temperature Relationship and Resistance to Oxidation

The viscosity index (V. I.) system of Dean and Davis ([6]) as modified by Davis, Lapeyrouse and Dean ([5]) will be used in this paper for purposes of correlating the viscosity-temperature characteristics of "raffinates," finished oils, and "extracts." In this system, oils of 95 to 105 V. I. may be classified roughly as Pennsylvania type, while those of 0 to 20 V. I. represent the usual products of Gulf Coast crude. Some use will also be made of the viscosity-gravity constant (V. G. C.) of Hill and Coats ([11]) values of which vary from 0.810 for Pennsylvania to 0.900 for coastal types.

Resistance to oxidation is expressed in terms of "sludging time," which is the number of hours required for an oil to form a given quantity of asphaltenes when oxidized at a specified elevated temperature. The test has been correlated with tests of oils in an engine and is a direct measure of the useful life of a lubricant under severe crankcase conditions.

Methods of Extraction

Extractions may be carried out by (a) single batch application of the solvent, by (b) multiple batch application, wherein fresh portions of the solvent are used in repeatedly extracting the raffinate, by (c) batch counter-current, wherein the solvent and oil pass countercurrent through a number of separate extraction tanks, and (d) by counter-current flow in a single vessel. These methods are given in the order of their increasing efficiency and will be discussed later.

The "Ideal" Selective Solvent

The ideal solvent would separate completely the desired from the undesired oils. In the present case the oil desired is of high viscosity index and is less soluble in all selective solvents than the undesirable oil of low V. I. The ideal solvent, then, would dissolve no oil of high V. I. but would be miscible in all proportions with low V. I. oil at normal extraction temperatures.

Chlorex a Selective Solvent

Solvents heretofore proposed for extraction may be classified into two types, neither of which is ideal. The types are (a) those solvents which, although miscible in all proportions with low V. I. oil, nevertheless dissolve excessive quantities of high V. I. oil, and (b) those solvents in which the high V. I. oil is nearly insoluble, but in which the low V. I. oil, though more soluble, is by no means miscible in all proportions.

In Figure 1 the solvent action of Chlorex ($\beta\beta'$-dichloroethyl ether) is compared with that of nitrobenzene, an example of the first type, and with that of ace-

Table 1

Properties of $\beta\beta'$ Dichloroethyl Ether

Structural formula	$Cl \cdot CH_2 \cdot CH_2 — O — CH_2 \cdot CH_2 — Cl$
Boiling Point (sea level)	352.4°F (178°C)
Freezing Point	—61°F (—51.7°C)
Specific Gravity at 20°/20° C	1.222
Viscosity, centipoises at 25.5°C	2.0653
Viscosity, Saybolt Universal at 77°F (25°C)	32 seconds
Viscosity, Saybolt Universal at 32°F (0°C)	39 seconds
Vapor Pressure at 100°F 10 mm.	
Latent Heat of Vaporization	115.4 B.t.u./lb. (64.1 Cal./gm.)
Specific Heat (at 85° F)	0.369
Flash (closed cup)	168°F (75.6°C)
Solubility in water at 20°C	1.01%
Solubility in water at 90°C	1.71%

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tone, an example of the second type. Chlorex soluble oil, of very low V. I., is miscible in all proportions with both Chlorex and nitrobenzene above 32°F., but is soluble in acetone only to the extent shown. The very low solubility of high V. I. oil in Chlorex is evidence of its close approach to the "ideal" selective solvent.

Table 2 substantiates the data of Figure 1. The low solubility of 100 V. I. oil in Chlorex is again evident from its high yield of oil of this quality. Acetone exhibits a poor selectivity, as measured by V. G. C. or V. I. difference (between raffinate and extract), which may be explained by its insufficient solvent capacity for low V. I. oil.

Table 2

Single Batch Extraction with Chlorex*, Nitrobenzene and Acetone*****

(200 volumes solvent used to 100 volumes oil, in all cases)

	Original Oil	Chlorex Raffinate	Chlorex Extract	Nitrobenzene Raffinate	Nitro-benzene Extract	Acetone Raffinate	Acetone Extract
Viscosity at 210°F	49.	49.	55.	48.	53.	48.	52.
Viscosity at 100°F	272.	233.	582.	216.	406.	236.	390.
Viscosity Index	77.5	104.0	5.4	104.5	54.1	89.4	49.8
V. G. C.	0.845	0.828	0.898	0.819	0.871	0.833	0.891
Gravity A. P. I.	25.8	28.5	18.0	29.8	21.8	27.7	19.8
ASTM Pour Point	0°F	5°F	—10°F	5°F	—10°F	0°F	—15°F
Yield, Volume %	100.0	74.8	25.2	51.1	48.9	79.2	20.8
"Selectivity"****		98.6		50.4		39.6	

*Miscible at 120°F; extraction at 77°F
**Miscible at 93°F; extraction at 50°F
***Miscible at 120°F; extraction at 80°F
****"Selectivity" is expressed as V. I. of raffinate minus V. I. of extract.

Note: SO_2 is an example of an extremely selective solvent of very low solvent power. Forty-three equal applications of SO_2 (on an untreated Salt Creek stock) for a total of forty-six volumes of solvent to one volume of oil, produced a raffinate of 61.0 V. I. and an extract of —200 V. I. Hence the quality of the raffinate, even after this excessive extraction, is still unsatisfactory, although the V. I. difference, or "selectivity" is 261.0.

Extraction of Various Oils

Table 3 illustrates the adaptability of multiple Chlorex extraction to stocks of widely different viscosity and viscosity indices. Oils 1 and 4 are Mid-Continent type, while oils 2 and 3 are of California and Pennsylvania origin, respectively. It is to be noted that raffinates of satisfactory V. I. are obtainable from each, while the appreciable content of very low V. I. oil extracted from the Pennsylvania sample is particularly interesting. The quantities of solvent used would be materially lowered by counter-current application, the quantities necessary being roughly proportional to the difference between multiple and counter-current application shown in Figure 2. That extraction is not always accompanied by a decrease in viscosity of the raffinate is shown by the appreciable increase to be noted in the case of oil 2. As a general rule, cylinder stocks show a loss in viscosity upon extraction, regardless of their original viscosity index.

Oxidation Resistance and Conradson Carbon

The effect of Chlorex extraction upon the oxidation and Conradson carbon values of stocks of widely different character is shown in Table 4.

Cylinder stocks have invariably shown a greater resistance to oxidation (or "sludging" in actual use, as confirmed by engine tests) than distillate oils of similar origin. It will be noted that the Chlorex raffinates, regardless of the viscosity or V. I. of the original oil, show a useful life considerably in excess of the unextracted oils. It is especially significant that the high V. I. of sample 8, a Pennsylvania grade oil, is in no way an indication of resistance to sludging, although the raffinate from this oil is satisfactory. Sample 9, of California origin, likewise yields a superior grade of lubricant after extraction with Chlorex. That the method of extraction affects oxidation resistance is shown by a comparison of samples 5 and 6. There is evidence of some parallelism between improvement in V. I. and improvement in resistance to oxidation, effected upon a given oil, by Chlorex extraction.

Table 4 also includes carbon residue data, the values of which are very substantially lowered in all cases, following treatment of the oils with Chlorex.

Comparison of Methods

Most of the experimental extractions reported in this paper were performed by either single or multiple applications of solvent, the method employed being stated in each case.

Figure 3 gives a comparison of the efficiency of three methods of extraction from the standpoint of yields obtained for a given quality, or viscosity index, of raffinate as applied to an S. A. E. 20 oil. If it is assumed for this particular case that the oils contain only a 100 V. I. component, soluble in Chlorex or nitrobenzene to the extent indicated on Figure 1, and a low V. I. component, completely soluble in either Chlorex or nitrobenzene, a value may be obtained representing the maxi-

Table 3

Chlorex Extraction of Oils from Various Sources

Oil No.	Vis. at 210°F of Charge	V.I. of Charge	V.G.C. of Charge	% Vol. Chlorex	% Vol. Yield of Raffinate	Vis. at 210°F Raffinate	Vis. at 210°F Extract	V. I. of Raffinate	V. G. C. of Raffinate	V. I. of Extract	V. G. C. of Extract
1	49.0	77.5	0.845	200	74.8	49.0	59.0	104.0	0.828	14.2	0.896
2	59.0	54.3	0.868	600	30.6	66.0	59.0	95.0	0.811	13.8	0.896
3	50.5	103.0	0.822	200	87.5	50.0	60.0	117.0	0.808	8.4	0.902
4	183.0	85.0	0.827	600	73.5	142.0	625	99.5	0.807	*	0.903

*Too viscous at 100°F

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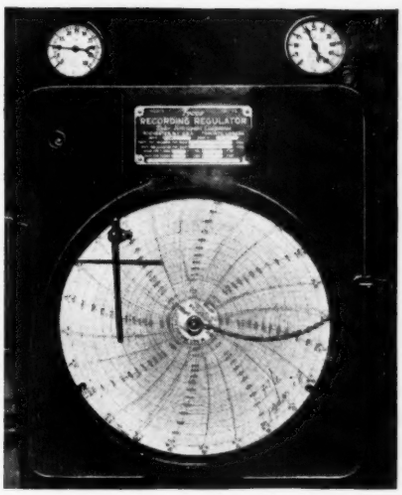

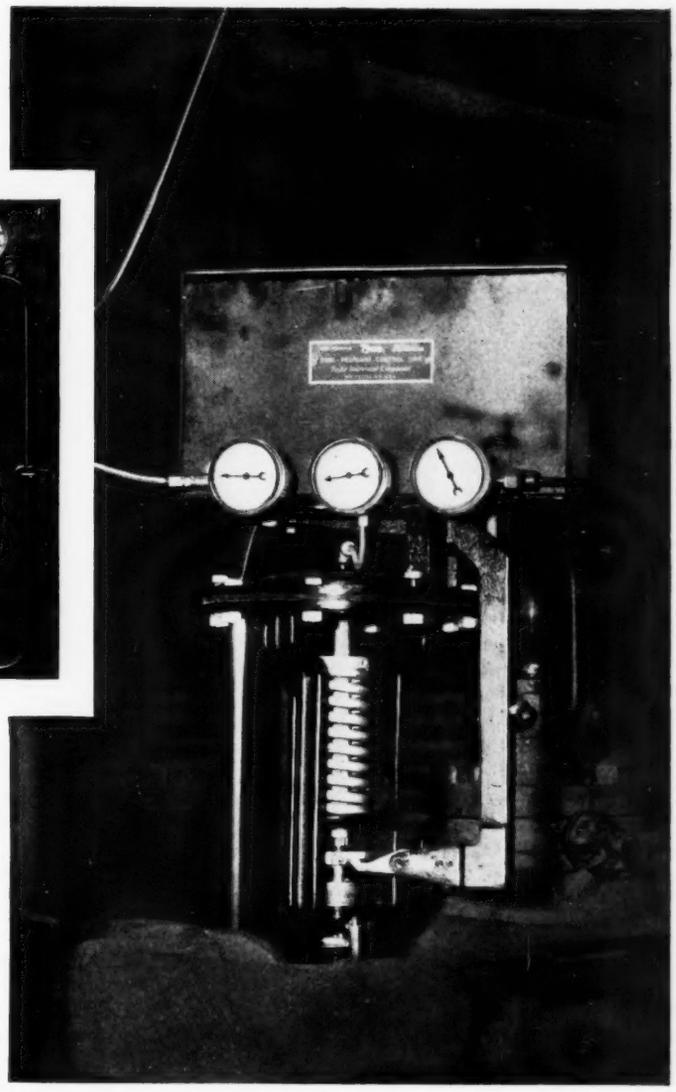

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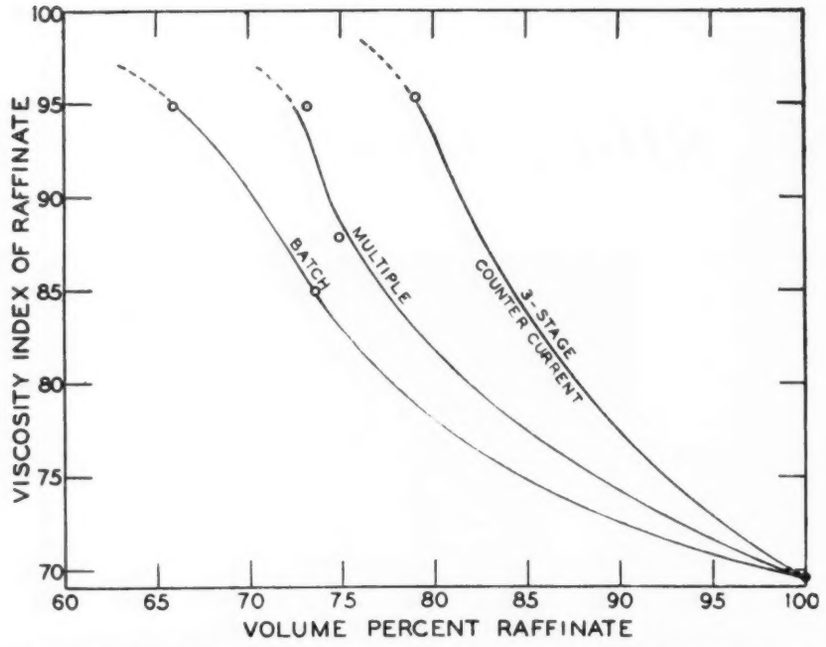

Fig. 3—Extraction of an S. A. E. 20 grade oil, showing effect of method of extraction on yield of an oil of given viscosity index

mum 100 V. I. content of the stock by addition of the yields obtained to the indicated quantity dissolved at the temperature of extraction. For Chlorex, this sum is 81.8%; for nitrobenzene, 82.9%; which difference is probably within experimental error. Since the curve for counter-current extraction (in Figure 3) is based upon the use of 250 volumes of Chlorex to 100 volumes of oil at 60°F., a yield of approximately 77% of 100 V. I. raffinate would be expected, which is in close agreement with the yield actually obtained.

The data of Figure 2 were obtained on an oil of S. A. E. 50 grade, and show the relative quantities of Chlorex necessary to obtain a given V. I. by three methods of extraction. The economy of the 3-stage counter-current system is evident.

The lower yields of 100 V. I. material obtained by the less efficient methods of batch or multiple extraction are due to the higher solvent requirements of these methods, with a consequent loss of greater quantities of dissolved raffinate.

Figure 4 illustrates the effect of temperature and solvent ratio upon the yield and viscosity index of the raffinate. The data for this plot were obtained by extracting batchwise a dewaxed Mid-Continent S. A. E. 50 distillate of 102 viscosity with three ratios of solvent at four temperatures. The solid lines represent the results at constant solvent ratio while the dashed lines represent results at constant temperature. It will be noted that the viscosity index of the raffinate increases with increasing temperature of extraction with constant solvent volume while the yield of a given V. I. raffinate increases with decreasing temperature and increasing solvent ratio. Thus the yield and viscosity index of the raffinate may be varied over a wide range by varying the temperature and solvent ratio. This affords extreme flexibility in the manufacture of lubricating oils.

The Chlorex solvent process for production of high V. I. oils may be combined with acid treating. In general the result of the combination is to produce a yield of a given V. I. oil substantially identical with that for the solvent without acid, but with a small saving in solvent required. Further, the color of the finished product is somewhat improved in the combined process. Typical comparative results are shown in Table 5.

Plant Operation

A commercial Chlorex extraction plant, now based upon a 3-stage counter-current system of extraction, has been operating successfully for nearly a year at the Casper, Wyoming, plant of the Standard Oil Co. (Indiana). From the flow sheet of this plant in Figure 5 it will be seen that the entering stock, heated above its pour point, is mixed with twice-used solvent before cooling to the desired extraction temperature. Raffinate from this first extraction is treated with once used solvent from the final chamber, and raffinate from the second extraction is treated with fresh solvent. This plant utilized largely existing refinery equipment, and has a capacity of 500 barrels of finished oil per day. Another commercial plant of about 800 bar-

Table 4

Effect of Chlorex Extraction upon Oxidation and Conradson Carbon Value

	Before Extraction				After Extraction					
Spl. No.	Vis. at 210°F	V. I.	Sludging Time Hours	Conradson Carbon Residue	V. I.	Sludging Time Hours	Conradson Carbon Residue	Total % Chlorex	No. of Extractions	
1	46.	64.0	29.	0.034	108.0	74.	0.002	250	3	Oxidation by Method I*
2	50.	75.0	21.	0.050	96.0	71.	0.02	250	3	
3	90.	75.0	22.	0.784	90.0	116.	0.21	250	3	
4	183.	83.0	64.	2.693	92.0	240.	1.19	250	3	
5	90.	75.0	37.	0.784	85.0	107.	0.21	250	1	Oxidation by Method II*
6	90.	75.0	37.	0.784	90.0	127.	0.21	250	3	
7	50.5	75.0	19.5	0.051	102.0	110.	0.03	300	3	Oxidation by Method II*
8	50.5	103.0	30.	0.175	117.0	180.	0.13	200	2	
9	59.0	54.3	10.	0.638	95.0	83.	0.27	600	3	

*The two methods differ slightly in temperature, Method II is a development from Method I and has been shown to approximate engine results somewhat better than Method I.

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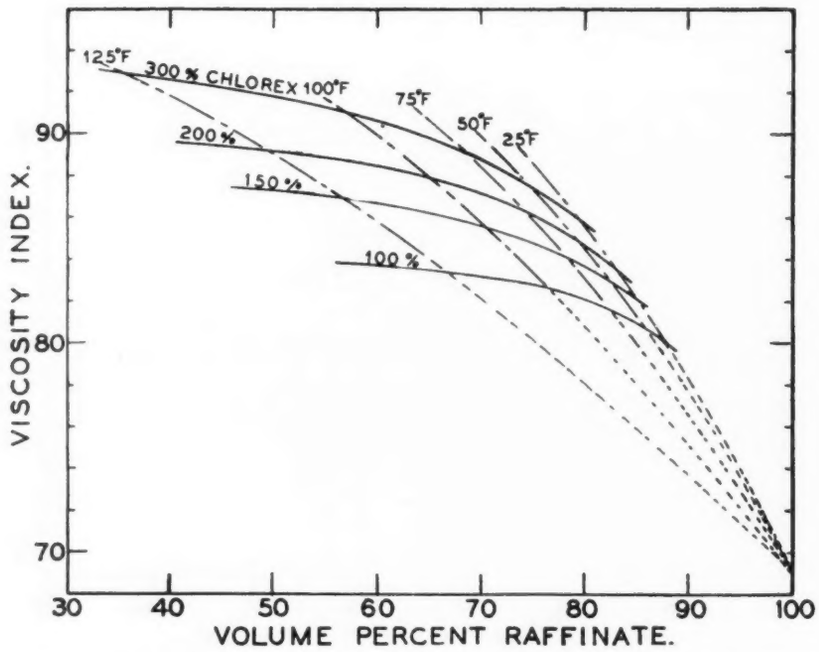


Fig. 4—Batch extraction of an S. A. E. 50 distillate, showing effect of quantity of solvent and temperature of extraction on yield of oil of a given viscosity index

rels daily capacity using a continuous counter-current extractor is now going into operation.

Thorough contact of the stock with the solvent is essential to maximum efficiency, especially if the stock is waxy at extraction temperatures. Accordingly, mechanical agitation is employed for obtaining the desired contact. It should be pointed out that the very low viscosity of Chlorex is advantageous for getting good contact since a few per cent of Chlorex dissolved in oil produces a mixture which is very fluid, even with the most viscous oils.

Lubricating stocks varying in viscosity from the lightest motor grades to the heaviest cylinder stocks are handled without change in the general plan. The plant has operated continuously for over eight months upon a wax-bearing stock, the pour point of which is 120°F. (before extraction) and upon a partially dewaxed stock the pour point of which is 30°F. The presence of wax has in no way been a hindrance to extraction.

Petroleum wax is very slightly soluble in Chlorex at ordinary extracting temperatures and therefore may be looked upon as an inert diluent of the stock. Equal quantities of Chlorex, based upon the wax-free oil, produce raffinates of equal quality, whether applied to the wax-bearing or wax-free stock.

Recovery of Chlorex

Batch distillation with steam at atmospheric pressure in 300-barrel stills fired to 350°F., with a maximum stripping temperature of 450°F., has been the method employed to date for solvent recovery from both raffinate and extract. Pipe stills will shortly take over the distillation, thus effecting an economy of time and reducing the

Table 5

Extraction of M. C. Distillates—With and Without Acid Treating

Viscosity of Distillate	Acid Treatment	Volume Per cent Chlorex Used and Extraction Temperature	Finished Oil Yield	Viscosity Index of Finished Oil
115 at 210°F	None	200% at 100°F	65%	88
115 at 210°F	1 lb. 93% acid per gallon	170% at 100°F	64%	88
51 at 210°F	None	200% at 50°F	74%	98
51 at 210°F	1 lb. 93% acid per gallon	160% at 50°F	70%	98

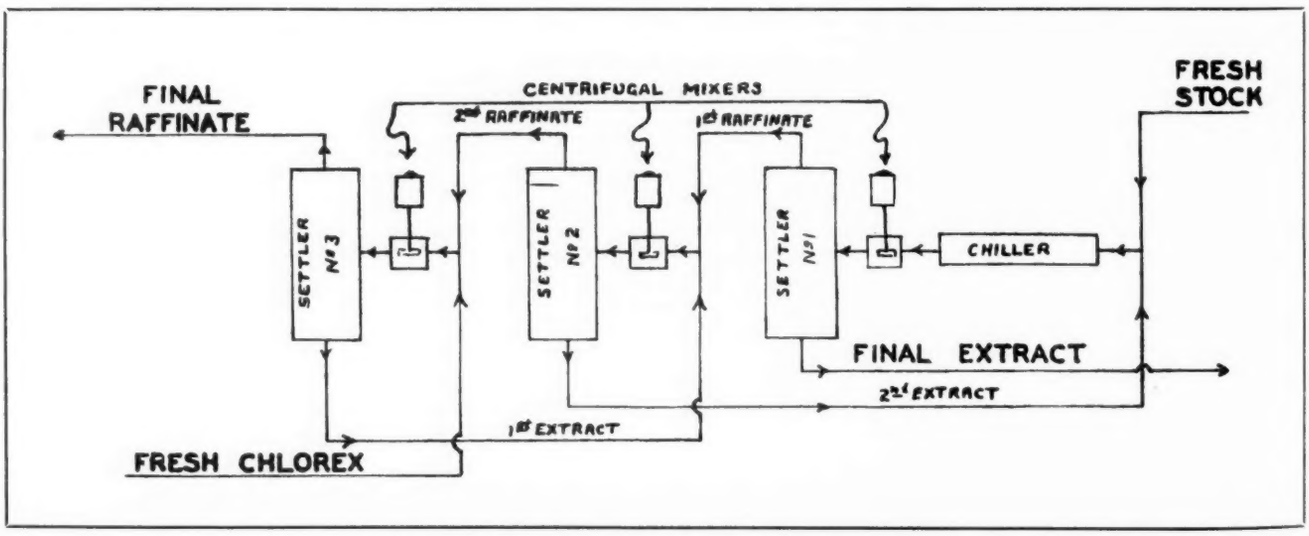
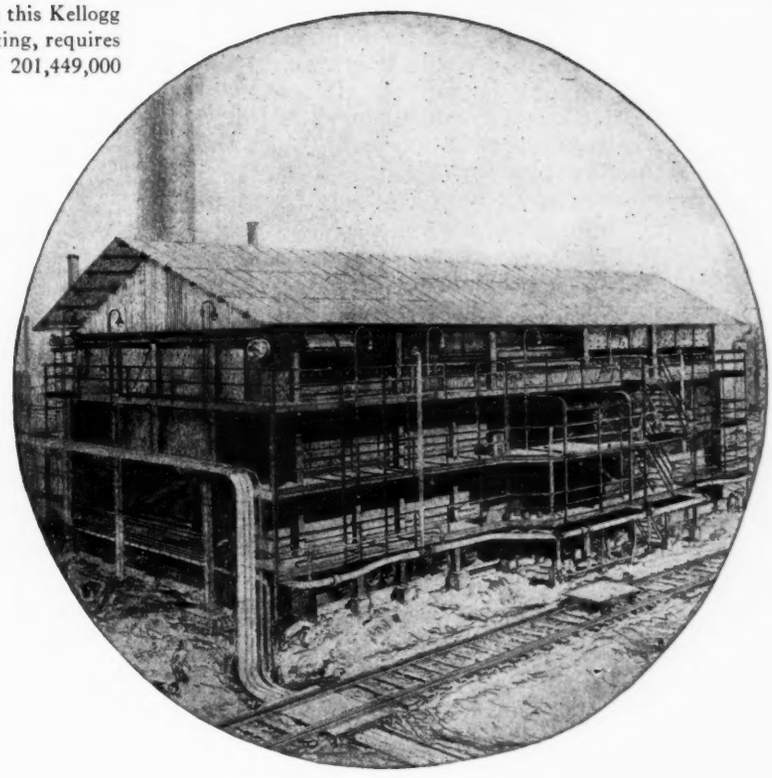


Fig. 5—Flow diagram of chlorex extraction plant

The heating load on this Kellogg furnace, now operating, requires the liberation of 201,449,000 B.t.u. per hour.



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total quantity of solvent in circulation.

In spite of the fact that the oils, especially the extracts, have been subjected to high temperatures in contact with Chlorex for periods varying from 48 to 60 hours, in batch distillation, reaction of the solvent with either raffinate or extract has been negligible. No coke is deposited in the stills or left in the reduced oils, and only a slight darkening of the raffinate is noticeable. No trace of Chlorex is left in the oils.

Quantitative determinations of total chlorides in the reduced oils have been made at frequent intervals which reveal a content, calculated as HCl, varying from zero to 0.0017% for the raffinates, and from zero to 0.010% for the extracts. (A positive test for chlorides cannot be obtained upon either raffinates or extracts which have been percolated through, or contacted with, decolorizing clays.)

Since the solubility of Chlorex in water is about 1% at ordinary temperatures, means of recovering the solvent from condensed steam were necessary. The solvent may be completely extracted from water by agitation with oil but the simpler method of flash distillation is employed at present. In practice, a recovery of 90% of the total dissolved is effected through the distillation of about 12% of the water solution.

Decomposition of Chlorex and Overall Recovery

Although Fife and Reid state that dichloroethyl ether is both stable and non-corrosive ([7]), they do not give data to substantiate their claims. Extensive laboratory work was therefore carried out prior to the adoption of Chlorex as a selective solvent. Diverse tests repeatedly demonstrated the unusual stability of this chlorinated compound compared with others. The technical grade as received contains an average of 5.5 mgs. of HCl per 100 c.c. This amount is increased by only 12 mgs. upon refluxing a solution containing 10% of extract and 0.6% steel wool at 340°F for four hours. Hydrochloric acid is formed in only very minute quantities during distillation with steam or under reduced pressures. Such traces should be neutralized after each distillation to prevent corrosion and minimize decomposition on subsequent distillations. Having once removed all traces of HCl, recovered Chlorex is found to be much more stable than the new product.

The loss of Chlorex in plant operation does not exceed 0.2% per cycle. The solvent now in use has been distilled some 500 times and its properties are substantially identical with those of the new solvent. Its efficiency as a selective solvent is equal in all respects to that of new material.

Possibilities of Process

In conclusion it seems desirable to point out some of the general possibilities of the Chlorex solvent process. Heretofore refiners have been limited in the quality of lubricants which they could produce from the crudes readily available to them. Thus, while it has long been realized that even crudes bearing relatively low V. I. lub fractions could be made to yield small amounts of relatively good V. I. lubs through drastic chemical refining of the distillates (for example, with sulfuric acid or aluminum chloride) these methods have never been economically practicable for production of extreme increase in V. I. from crude to finished oil. With chemical refining processes for extreme increase in V. I. the obtainable yields have been found to be so small, the chemicals costs so high, and the portion of the oil rejected to sludge of such little value that these processes are considered economically impracticable. With a selective solvent such as Chlorex, on the other hand, maximum yields are obtainable while the extracts are in the form utilizable for cracking or for relatively valuable fuel. Thus the process opens up to many refiners new possibilities for the production of high quality lubricating oils.

Acknowledgment

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([17]) Wilkin, Oak & Barnard, S. A. E. Journal *22*, 213 (1928)

([18]) Wilson and Barnard, Proceedings A. S. T. M. Vol. 28, Pt. 2, p. 674 (1928)

Globe To Build Knowles Coke Ovens At Lemont

TULSA, April 1.—License for the construction and operation of a battery of Knowles coking ovens at the Lemont, Ill., refinery of the Globe Oil and Refining Co. has just been granted by the Brassert-Tidewater Development Co., of Chicago. Contract for the plant's construction has been let to H. A. Brassert and Co., Chicago.

These ovens will operate on heavy residuum from the Winkler-Koch cracking units in the Lemont plant. Company officials state that the outlet for disposal of very heavy residuum offered by the use of these ovens will enable them to produce greater yields of gasoline without the attendant residuum disposal difficulties. It is stated that a commercial coke will be produced from the ovens, along with gas oil, which will be sold as low cold test fuel or recycled for cracking stock.

A NEW PACKAGE!

A NEW DISPLAY STAND!

(Cans packed 24—1 qt. or 4—5 qt. cans to case)

To Help YOU Sell!

Valvoline—the *original* and best Pennsylvania Oil is now being sold in 1 quart and 5 quart cans! This is great news for jobbers who can now stock their dealers with a *complete line* of S A E numbers at a cost—to the dealer—of only a single barrel. And with every first order of nine assorted cases of Valvoline Motor Oil a sturdy display stand — FREE.

Wider Selling Possibilities

Jobbers! Think of what this means to you. Smaller inventory. Faster turnover. More dealers. Smaller credit risks.

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Dealers! Think what this means to you! Smaller investment. Wider public acceptance —cash in by selling these motorists who are now afraid of substitution! Faster service— with Valvoline's handy Canco dispenser. Better satisfied customers. More sales.

If you are tired of doing business without making a profit, sign and cut coupon below— then—send it today.

Division Offices: New York, Chicago, Cincinnati, Atlanta, Los Angeles. Refineries: Warren, Franklin, and East Butler, Pa.

VALVOLINE
THE ORIGINAL PENNSYLVANIA OIL

Foreign Offices: Liverpool, Paris, Hamburg, Johannesburg, Calcutta, Tokyo, Melbourne, Auckland, Buenos Aires.

SIGN • CLIP • SEND COUPON TODAY!

VALVOLINE OIL COMPANY, Carew Tower, Cincinnati, Ohio
Without obligation on my part, give me facts about Valvolines *New Deal* for Distributors and Dealers and more information about how your Valvoline in cans *builds bigger profits* from a smaller investment.

N.P.N.4

Name .....

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Street ..... *City* ..... *State* .....

Derby Reduces Farm Delivery Costs With Way-Station Bulk Plants

By William F. Lowe
N. P. N. Staff Writer

WICHITA, Kans. THE cost of delivering petroleum products to rural customers often makes this service unprofitable. Competition is usually so keen that profit margins do not allow much distribution expense, but the struggle for gallonage has led to some rather extreme measures in order to get the business.

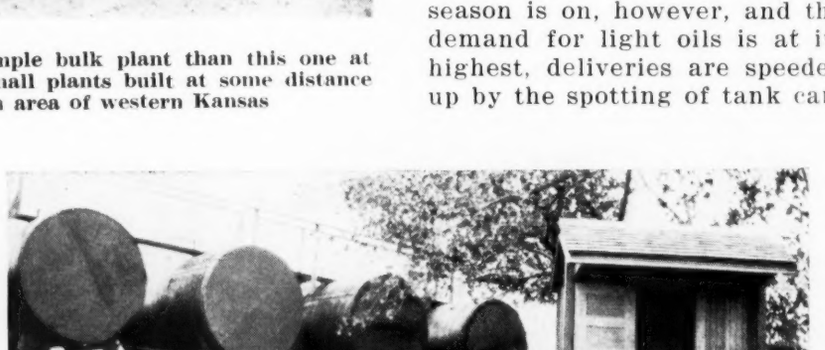
The usual method of building up "tractor trade" is by direct contact with the farm by means of tank truck routes. Large trucks, often hauling tank trailers, cover hundreds of miles every week making such deliveries. The investment in these units is large and their operating expense is one of the biggest factors in reducing the profits of this distribution system. A means of lowering this expense has been a problem of long standing with marketers generally.

One method of doing this is being developed in western Kansas. Tank truck routes have been considerably shortened through the erection of numerous small bulk plants as way stations. It is an obvious fact that these plants result in real savings as far as distribution costs are concerned, while at the same time they offer a means of increasing sales volume without a corresponding increase in marketing equipment investment. Located usually in the heart of farming areas and operated by an agent working entirely on a commission basis, these plants take on the personal touch of local institutions with all of the favorable prejudice that goes with this term.

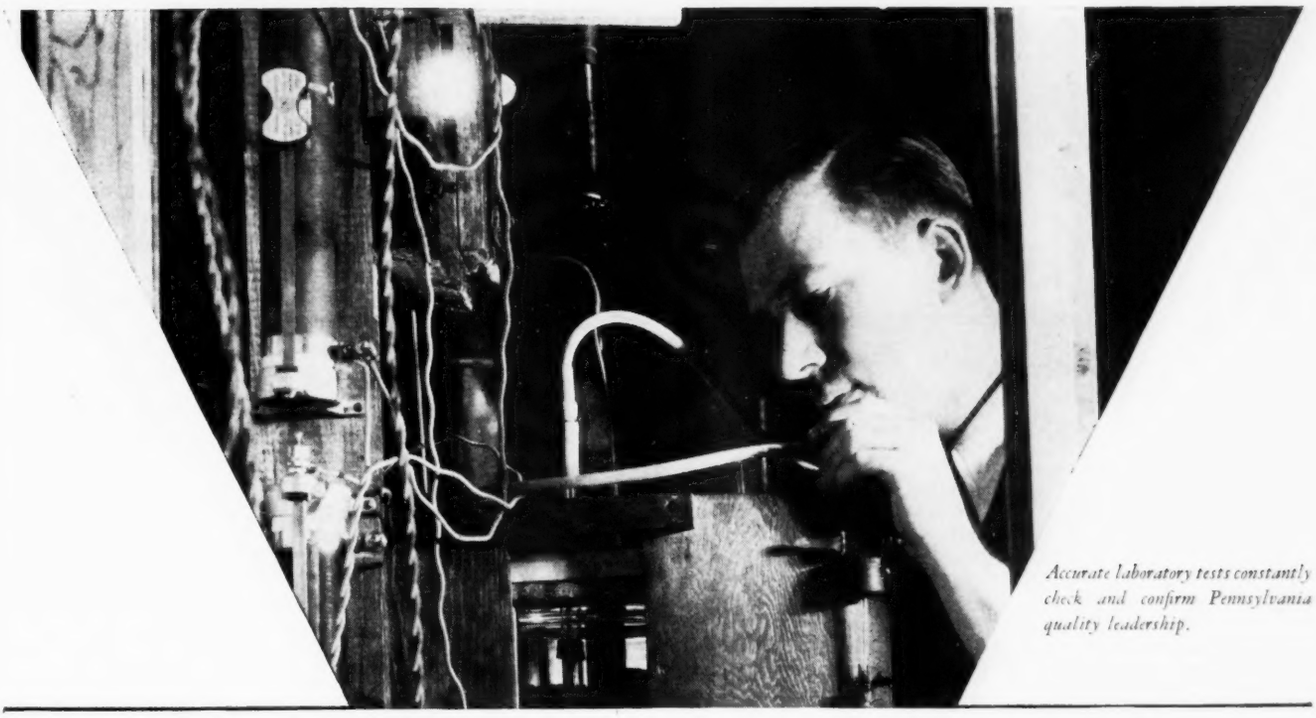
One of the companies which has adopted this method of distribution to increase sales in "tractor country" is the Derby Oil Co., Wichita, Kans. This company has 11 such bulk plants in the farming territory within 100 miles of its home office, each unit serving a district having a radius of 10 or more miles.

During a large portion of the year deliveries to the plants are made out of Wichita by four company trucks which have tank capacities varying from 1700 to 4000 gallons. Each truck has a trailer for transporting the barreled lubricating oil stocks. When the harvest season is on, however, and the demand for light oils is at its highest, deliveries are speeded up by the spotting of tank cars

It would be hard to build a more simple bulk plant than this one at Pretty Prairie. It is typical of the small plants built at some distance from any railroad in the farm area of western Kansas

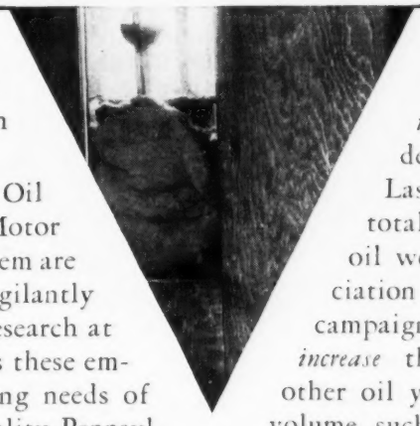


Storage tank and combination meter house and loading dock set-up at the Ellinwood bulk plant of the Derby Oil Co. Note tank loading connections in the ground on the left of the loading dock



Accurate laboratory tests constantly check and confirm Pennsylvania quality leadership.

Better Business—when you sell *Better Oils from the Ground Up!*



Every price market is followed by a quality market. That's happening in motor oils—right now!

The Pennsylvania Grade Crude Oil Association anticipated this trend. Motor oils sold under the Association emblem are being quality-safeguarded more vigilantly today than ever before. Constant research at the Association's laboratories keeps these emblem oils in tune with the exacting needs of modern motors. With premium-quality Pennsylvania motor oil, emblem-protected, *you* can successfully compete on a *quality* basis!

An emblem Pennsylvania oil is *sure to sell!* One in every three motorists demands a Pennsylvania motor oil. Last year between 25% and 35% of the total United States retail sale of motor oil went to Pennsylvania oils. The Association is carrying on a large, continuous campaign of advertising this year that will *increase* this overwhelming preference. No other oil you can sell brings you such ready volume, such fast turnover, such good profit.

Enjoy this better business yourself—right away! Sell a Pennsylvania motor oil—under the emblem!

PENNSYLVANIA GRADE CRUDE OIL ASSOCIATION, OIL CITY, PENNSYLVANIA

THE ASSOCIATION EMBLEM

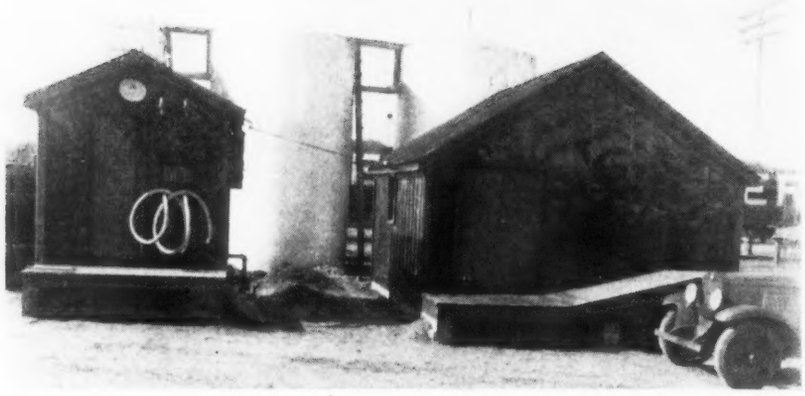
The privilege of displaying this emblem is one which your oils can enjoy. Motorists are being told exactly what it means—a 4-point program of quality protection. New regulations for using the emblem will be sent on request.

MEMBER OF PENNSYLVANIA GRADE
Guaranteed
100% PURE
PENNSYLVANIA
OIL
CRUDE OIL ASSOCIATION
PERMIT NUMBER .....
Made from
the highest grade crude oil in the world
COPYRIGHT 1933 BY PENNSYLVANIA GRADE CRUDE OIL ASSOCIATION

THE ASSOCIATION ADVERTISING

The Saturday Evening Post, Country Gentleman and Time are carrying full page advertisements, doing a great selling job for you if you sell a Pennsylvania oil under the Association emblem. Show this advertising to your customers.

BETTER OILS FROM THE GROUND UP!



A little larger than some, but not a great deal more expensive is this railroad siding plant at Macksville, Kans. Note the loading dock on the left where the meters may be watched through the opening just above the hose connections

at those few plants which are located on railroads. The trucks are then released from these points and serve only the outlying plants, operating 24 hours a day.

Each of the trucks is equipped with a rotary unloading pump which is chain driven from a power take-off on the transmission. All loads taken on, except those from the tank cars, are metered into the tanks, though the trucks themselves do not carry these measuring devices. Loads to be transferred from the trucks to the bulk tanks are stick gauged and corrected to 60°.

The bulk stations themselves have about as simple a general set-up as could be made and their average cost, including labor and materials is approximately $1200. The unit at Ellinwood is a typical example, though its storage facilities are a little larger than the average. At this plant there are four 2000-gallon tanks, two of which contain different grades of gasoline and the others kerosine and distillate, respectively. Each is equipped with a low pressure vent and all are filled and unloaded from the bottom. They are mounted eight feet above ground on steel supports set in concrete piers.

A small and inexpensively constructed warehouse gives storage space for the few barrels of lubricating oil and canned greases that comprise the small heavy oil stock, while another building, approximating in size and general appearance the famous Chick Sale "two holer," houses the individually metered hose connections which constitute a loading dock.

Most of these stations have no pumps, all loading being done by gravity feed from the overhead tanks. At Macksville, however, one of the few bulk plants of this type located on a railroad, perpendicular tanks necessitate a pump unit. As shown in an accompanying photograph, this is the usual small motor driven twin rotary, one pump handling the gasolines and the other kerosine and distillate. Each pump has its own meter unit, and a close manifolding hook-up practically eliminates contamination between products.

"Cash and Carry" sales, which are more or less common in western Kansas, are discouraged at these stations and they are only made at those points where competition necessitates them.

Whenever it is possible to do so operators for the plants are chosen from the neighborhood in which the station is located, since a wide acquaintance in the farming communities is a decided business asset. An operator usually receives a gallonage commission on all sales so that his income is in direct proportion to the effort exerted in increasing his volume. He must have his own light truck, usually a Ford or Chevrolet, on which the company will place a compartment tank having a total capacity of approximately 400 gallons. The company then aids him in laying out regular routes of call throughout his district.

In making these regular visits to consumers lies the real success of the system both for the operator and the oil company. Farmers can count on his coming at a certain time and will wait for him if possible. On the other hand, the operator can soon learn the demands of each customer and how to meet them without retracing his steps and running up unnecessary mileage on his own truck. A regular system of routes also allows time for the solicitation of new accounts.

Daily reports are sent to the home office from each plant by the agents, thus an accurate check on the stocks is possible at any time and few chances are taken on having them run too low. It is also possible to plot the activities of any agent to determine his ability as a salesman. As far as light oils are concerned, both stock and sales are based on meter readings and the losses noted are negligible compared with former stick gauges. The agent is held responsible only for the volume of these oils registered by his meters.

Babcock-Wilcox Man Dies

NEW YORK.—H. G. Barnhurst, representative in the cement sales department of the Babcock & Wilcox Co., New York, died March 18 while asleep at the home of a coworker in the Chicago office. He was 60 years old.

Correction

The following corrections have been received for the roster of oil associations following its publication in the March 1 issue, pages 62 and 64. Please make them in your list to bring it up-to-date:

Independent Oil Men's Association of New England; president, Fred E. Bergfors, Quincy Oil Co., 56 Federal Ave., Quincy, Mass. Secretary, William J. Bursaw, Bursaw Oil Co., Salem, Mass.

Iowa Petroleum Association, change address from Securities Bldg., to 1101 Register-Tribune Bldg., Des Moines, Ia.

ADVERTISING PAGES REMOVED

Refinery - Tank Wagon Markets

Refinery Prices End March At Low Levels; Open Market Trading Continues Light

CLEVELAND, April 3

REFINED oil markets ended March with prices still at or near the all time low levels recorded in the last few months. Activity last week was purely of a routine nature. Open market trading continued virtually at a standstill as both buyers and sellers remained hesitant about making commitments.

The eyes of the oil industry continued to be turned on Washington from where it was hoped encouraging developments would be forthcoming to save an oil price situation which has gradually been drifing from bad to worse. Thus far President Roosevelt has made no statement regarding oil following receipt of the recommendations of the oil states governors conference committee.

Retail cash discounts on gasoline at service stations gained considerable headway in the east. Standard of Ohio advanced its posted service station prices 1 cent a gallon coincident with its inauguration of a 1-cent cash discount policy to all classes of trade but at many points in the east, and particularly along the northern Atlantic seaboard, posted prices were advanced only 1 cent with 2 cents off allowed for cash, resulting virtually in a 1-cent reduction.

Since jobbers in most parts of the country hold gasoline contracts which are much more favorable currently than the open market, demand in the open market remained at low ebb last week. The commodity, however, is now able to stand almost any kind of a shock since refinery prices generally are considered below the cost of manufacture.

Here and there a product could be singled out which presented some semblance of stability. Mid-Continent kerosine was in good demand with both refiners and jobbers active in placing orders. Pennsylvania wax also continued to get considerable play with prices holding fairly well at the higher levels established recently. Bunker oil was steady at $0.50 a barrel at the Gulf. Prices of other commodities, however, were easy in virtually all markets.

The export situation took on rather of a hazy outlook with reports to the effect that there had been large accumulation of Roumanian gasoline in the first three months of this year. Negotiations were believed to be under way for this gasoline to be absorbed by American companies abroad, but in the meantime Roumanian refiners were again actively bidding for European favor by shading American Gulf prices just enough to get the business.

Leading Gulf suppliers of cased goods reduced gasoline prices 25 cents per case and kerosine prices 15 to 20 cents.

Chicago Prices Steady Despite Easy Crude Market

Staff Special

CHICAGO, April 1

REFINED oil prices remained fairly steady in the Chicago market in the week ended April 1, despite the generally unsettled condition of the crude oil price structure in the southwest.

Interest of both buyers and sellers centered mainly on the meeting at Washington and interest in the spot gasoline market was negligible in most quarters. The general opinion was that there was little possibility of an advance in tank car prices until the situation in East Texas and Oklahoma City was straightened out.

Reports of heavy overproduction of crude oil and the low prices at which it was moved had the effect of keeping gasoline buyers out of the market except for amounts actually needed to keep them operating. The bulk of the buying that was done appeared to be on previously made contracts and open market sales were at low ebb.

Despite these bearish influences there seemed to be an undercurrent of optimism regarding the situation and gasoline prices generally were maintained at levels close to those prevailing at the end of the previous week. One reason given for this was that gasoline prices were so near, or lower than, actual refining costs, regardless of the price of crude, that refiners were making little effort to push sales. Another reason for the comparative steadiness of the gasoline market was that traders believed that some drastic action might be taken by the federal government which would have the effect of improving the market, for a short time at least.

The general asking price for U. S. Motor gasoline, below 57 octane number, remained at 2 cents and up throughout the week. Some shading of the 2-cent price was noted, but the amount of gasoline available at the lower prices, was reported small in comparison to that bringing the higher price. Carlot marketers generally reported there were a few spots where they could buy U. S. Motor at 1.75 cents, for resale at a higher figure, but that most refiners asked them at least 1.875 cents for a fair grade of gasoline.

Kerosine continued to be the brightest spot in the market from the standpoint of steadiness of price and open market demand. Sellers generally reported they were doing a satisfactory

Summary of Group 3 Quotations for U. S. Motor Gasoline

In Effect April 3, 1933

	Below 57 Octane No.	57-65 Octane No.	Above 65 Octane No.
Okla.	2.00-2.25	2.375-2.625	2.625-2.875
Kans.	2.125-2.375	2.50-2.75	2.75-3.00
N. Tex.	2.125-2.375	2.50-2.75	2.75-3.00
W. Tex.	2.125-2.375	2.50-2.75	2.75-3.00
E. Tex.	2.00-2.125	2.25-2.50	2.625-2.875
La.-Ark.	2.125-2.375	2.50-2.75	2.75-3.00
Ind.-Ill.	2.00-2.125	.....	.....

Prices are those quoted on the basis of f.o.b. Group 3 by refiners in the districts designated.

volume of business and quotations for the 41-43 w.w. grade remained at a minimum of 2 375 cents over the week.

Demand for furnace oils was reported only fair, but prices showed little change in most quarters. Several traders voiced the opinion that distillate demand would improve following the reduction in freight rates to the level of gas and fuel oils on April 1.

Gas and fuel oils were quiet, and prices of several grades were lower.

Mid-Continent Refinery Markets

Kerosine Heads List In Volume Of Trading

Staff Special

TULSA, April 1

KEROSINE stepped to the head of the list of active commodities in the Mid-Continent refinery market the last week in March.

A few refiners the previous week had bought sizeable quantities for both prompt and deferred shipment. This buying had been to supplement their own production in some instances, while in others it was done to provide the material for their regular contract gasoline buyers.

This week the buying was largely from jobbers. Orders showed considerable increase in several quarters. This was true especially at plants which make a better grade of kerosine. In view of the gasoline situation, however, buying had not as yet reached proportions that would indicate more than a slight upturn in prices.

Gasoline movement under contract was comparatively brisk throughout the week, but open market buying was light in all districts.

Jobbers continued to watch the situation in Washington and to remain out of the market as much as possible. Most of the spot market business continued to find its way either directly or indirectly to East Texas. In some instances refiners in other areas met the East Texas prices but this was an exception rather than the rule.

Occasional buying of East Texas gasoline for coastwise movement continued to be done and this probably prevented prices from dropping still further, some sellers said. Most of the refiners in East Texas who have been in the habit of shipping their production in tank cars reported they were selling only from day-to-day in view of the crude situation and that they were in fairly good shape as far as stocks were concerned.

Some tank wagon prices were lower

Chicago Tank Car Market

Following prices are in cents per gallon, except fuel oil in barrels, in tank car lots, representing majority of sales to jobbers on Group 3 freight basis, although shipments may originate in other refining districts, such as North, West and East Texas, Louisiana, Arkansas, Indiana, Illinois, Kentucky, etc. Prices do not include state or federal taxes levied on some products.

	Prices April 3	Prices March 27	Prices March 20
50-52, 437 e.p. naphtha	2.00 – 2.125	2.00 – 2.125	2.125– 2.25
U. S. Motor Gasoline:			
Below 57 octane number	2.00 – 2.25	2.00 – 2.25	2.125– 2.375
57-65 octane number	2.25 – 2.50	2.25 – 2.50	2.375– 2.625
Above 65 octane number	2.50 – 2.75	2.625– 2.875	2.75 – 3.00
60-62, 400 e.p. gasoline			
Below 57 octane number	2.125– 2.375	2.125– 2.375	2.125– 2.375
57-65 octane number	2.375– 2.625	2.375– 2.625	2.375– 2.75
Above 65 octane number	2.625– 2.875	2.75 – 3.00	2.75 – 3.00
64-66, 375 e.p. gasoline	2.625– 2.875	2.75 – 3.00	2.75 – 3.00
68-70, 350-360 e.p. gasoline	2.75 – 3.00	2.875– 3.125	2.875– 3.125
Aviation Gasoline, below 73 octane number	3.375– 3.50	3.50	3.50
41-43 water white kerosine	2.375– 2.50	2.375– 2.625	2.375– 2.625
42-44 water white kerosine	2.50 – 2.625	2.50 – 2.75	2.50 – 2.75
38-40 prime white Furnace Oil	1.75 – 1.875	1.875	1.875
38-40 straw Furnace Oil	1.75 – 1.875	1.75 – 1.875	1.75 – 1.875
32-36 dark gas oil	1.00 – 1.125	1.00 – 1.125	1.00 – 1.125
32-36 dark zero gas oil	1.75	1.75	1.75 – 1.875
32-36 straw zero gas oil	1.75 – 1.875	1.875	1.875– 2.00
28-30 zero fuel oil (per bbl.)	$0.675–$0.725	$0.725–$0.775	$0.725–$0.775
28-30 fuel oil (per bbl.)	$0.55 –$0.60	$0.575–$0.65	$0.575–$0.65
24-26 fuel oil (per bbl.)	$0.375–$0.45	$0.375–$0.45	$0.375–$0.45
18-22 fuel oil (per bbl.)	$0.275–$0.30	$0.275–$0.30	$0.275–$0.30
18-22 zero fuel oil (per bbl.)	$0.425–$0.475	$0.425–$0.475	$0.425–$0.475
14-16 fuel oil (per bbl.)	$0.25 –$0.275	$0.25 –$0.275	$0.25 –$0.275

Naphtha and Solvent

(Prices are in cents per gallon, in tank car lots, as quoted by Chicago sellers)

	April 3		March 27	
	F.O.B. Group 3 Basis	F.O.B. Chicago District	F.O.B. Group 3 Basis	F.O.B. Chicago District
Stoddard Solvent	4.50 – 5.00	7.00 – 9.00	4.50 – 5.00	7.00 – 9.00
V.M. & P. Naphtha	4.75 – 5.25	7.50	4.75 – 5.25	7.50
Cleaners Naphtha	5.00 – 5.25	9.00	5.00 – 5.25	9.00
Oleum Spirits	4.00 – 4.25	6.00	4.00 – 4.25	6.00
Rubber Solvent	4.75 – 5.25	10.00	4.75 – 5.25	10.00
Lacquer Diluent	6.50 – 6.75	9.50	6.50 – 6.75	9.50

than those quoted for tank car movement, but the tank wagon deliveries were confined almost entirely to a small radius around the plants in East Texas.

The milder weather apparently has caused an increase in demand for ordinary U. S. Motor gasoline, and the higher octane grades lost some ground along with the low octane grades. The higher octane gasoline was reported more freely offered in the open market.

Refiners reported fuel oil buying had declined considerably since the bank holidays. Material at the same time was offered more freely in several districts. One buyer said he had been offered fuel oil in East Texas this week at 9 cents a barrel. The grade and amount were not revealed.

The lack of buying was attributed to a lighter demand from industrial consumers, and to the milder weather in much of the middle west.

The high gravities held their ground fairly well, due to the relatively small amount available for open market trading, but the lower gravities dropped off in some instances 2.5 to 5 cents a barrel.

Gas oil buying was fair, most refiners said. There was still a fair demand for the ordinary grades for cracking purposes and the amount of cracked gas oil offered was not sufficient to cause any price decline of consequence.

Furnace oil demand became lighter as milder weather set in. New orders were scarce while shipments against contracts were smaller in volume. Jobbers were working off their stocks as rapidly as possible. Neutral oils marked time with demand light. Wax was quiet.

Natural gasoline buying showed some improvement late in the week as a few manufacturers bought to fill out their March commitments. This buying took most of the Grade 26-70 off the market which had been offered at 1.25 cents in Oklahoma and prices moved up 0.125 cent April 1.

Jobber buying of naturals remained comparatively light, most sellers said, although there was some new activity noted in the lower vapor pressure grades.

Cosden Reorganization Expected After Sale

FORT WORTH, March 31.—Reorganization of the Cosden Oil Co. is expected to proceed shortly with the bidding of the properties by J. S. Cosden at the receivers' sale. Mr. Cosden represented the reorganization committee. His bid was $501,000. A reorganization plan has been approved by the courts, by more than 90 per cent of the creditors and by holders of approximately 90 per cent of the preferred and common stock.

The sale was held at Big Spring, Tex., by George N. Moore, special master. Mr. Cosden was the only bidder. His offer was $1,000 more than the minimum allowed by order of federal courts of the northern district of Texas and of Delaware.

Assets include the refinery at Big Spring and production in Howard and Ector counties and in south Texas, were sold. The refinery was finished in 1929. It will resume operations soon, it is reported.

Prices A Year Ago

April 4, 1932

	Oklahoma	Penna.
58-60 U. S. Motor (57-65 Octane No. in Okla.)	4.75-5.00	4.75-5.00
Grade 26-70, Natural Gasoline	2.125-2.25	.....
Kerosine (Okla. 41-43; Pa. 47 w.w.)	3.25	4.375-4.50
Fuel oil (Okla. 24-26; Pa. 36-40)	$0.425-$0.45	3.00-3.25
Crude (Okla. 35-35.9)	$0.75	$1.77
Chicago tank wagon (including 3c tax)	.....	15.00c

California Refinery Market

Retail Price Adjustments Improve Market

LOS ANGELES, March 30

READJUSTMENTS in third-grade gasoline prices, initiated by Standard of California at critical points throughout the state March 28, paved the way for improvement in gasoline marketing conditions. Other principal marketing companies met the new schedule.

In the Los Angeles territory, these changes boosted the third-grade retail price 1 cent to 11.9 cents. First-grade white and Ethyl brands were not affected, remaining at 15.5 and 18.5, respectively.

Retail prices in the San Francisco area, which had not been materially affected by recent disturbances in the southern part of the state and where prices consequently were higher, were reduced 1.5 cents on third-grade brands and 1 cent on first-grade white products. This averaging off will put state-wide marketing structures in a better position for any general price movement in the future.

At the end of the week, several independent refineries in the Los Angeles Basin were reported supplying gasoline in tank-truck-and-trailer lots at 4.5 cents, exclusive of all tax. This was 0.25 to 0.5 cent under prices quoted by other independent refiners and 2 cents under the third-grade wholesale schedules.

Supplied with this low priced product many of the larger cut-rate accounts continued to post retail prices of 9.9 and 10.5 cents. Leaders in the trade expressed the belief that the recent advance could not be maintained in the face of this competition. Several larger marketing companies were reported seeking to contract independent resellers on a 100 per cent basis for a year's period by offering differentials of 5-5-3 cents on Ethyl, first grade-white, and third-grade gasolines, respectively.

Current quotations for spot tank car and tank-truck-and-trailer movement of gasoline to points outside the state continued low in the face of Mid-Continent competition. A major refiner was reported to have sold several cars into Arizona at 4.4 cents, exclusive of all tax. Quotations ranged from 4.25 cents and up.

The market for burning oils was slack, with the exception of kerosine-distillate where good export demand was in evidence. Quotations for 38-40 gravity kerosine-distillate ranged from $1.20 a barrel and up. Gas and diesel oils were available at $0.85 to $0.95 and fuel oil continued easy in the domestic market with quotations as low as $0.35 a barrel.

Interest in California products for export was from Pacific foreign points. Members of the trade reported good sale and inquiry for kerosine and gasoline in cased and bulk lots. Prices remained unchanged.

Although an occasional inquiry for quotations on bulk gasoline appeared on the Pacific coast from east coast and Continental Europe buyers, low quotations at the Gulf continued to hamper actual sales. Current quotations for 375 e.p. gasoline ranged from 4 cents up. A cargo of about 70,000 barrels of gasoline of this quality was recently loaded at Union Oil Co.'s San Pedro terminal into the Norwegian tanker, Vivi, which is under charter to the Russian government. The reported price was 4 cents and the consignee was believed to be a Russian account at an Atlantic foreign port. This deal was negotiated prior to the break in Gulf quotations.

Refinery Markets on Light Oils and Lubricants

Prices given below are in cents per gallon, except where $ is shown in tank car lots, f.o.b. Refinery. They represent prices made only to domestic jobbers who resell to the consuming public, except where otherwise noted. Tank car prices do not include state or federal taxes levied on some products.

(These Refinery Prices compiled in the OIL PRICE HANDBOOK for a whole year)

GASOLINE AND NAPHTHA

	Prices April 3	Prices March 27	Prices March 20
OKLAHOMA (F. o. b. Oklahoma refineries)			
50-52, 450 e.p. naphtha...	2.00 – 2.125	2.00 – 2.125	2.125– 2.25
U. S. Motor Gasoline			
Below 57 octane number	2.00 – 2.25	2.00 – 2.25	2.25 – 2.375
57-65 octane number...	2.375– 2.625	2.375– 2.625	2.625– 2.75
Above 65 octane number	2.625– 2.875	2.75 – 3.00	2.875– 3.00
60-62, 400 E.P. Gasoline..			
Below 57 octane number	2.125– 2.375	2.125– 2.375	2.25 – 2.50
57-65 octane number...	2.50 – 2.75	2.50 – 2.75	2.75 – 2.875
Above 65 octane number	2.75 – 3.00	2.875– 3.125	3.00 – 3.125
64-66, 375 E.P. Gasoline..	2.75 – 2.875	2.75 – 2.875	2.75 – 2.875
68-70 350-360 e.p. gasoline	2.875– 3.00	2.875– 3.00	2.875– 3.00
Aviation Gasoline,			
Below 73 Octane number	3.25 – 3.50	3.375– 3.50	3.50
PENNSYLVANIA (F. o. b. Western Pennsylvania refineries)			
52-54 Naphtha.....	4.125– 4.375	4.25 – 4.50	4.25 – 4.50
54-56 Naphtha.....	4.25 – 4.50	4.50 – 4.75	4.50 – 4.75
U. S. Motor (58-62).....	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
64-66 390 e.p. gasoline...	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
68-70 350-360 e.p.....	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50
OHIO (Quotations of S. O. Ohio. Delivered any point in Ohio.)			
U. S. Motor Gasoline....	5.30	5.30	5.55
60-65 Octane number....	5.675	5.675	5.925
Above 65 Octane number.	6.05	6.05	6.30
KANSAS (F. o. b. refinery, Kansas destination)			
U. S. Motor Gasoline			
Below 57 octane number	2.25 – 2.50	2.25 – 2.50	2.375– 2.50
57-65 octane number...	2.625– 2.875	2.75 – 2.875	2.75 – 3.00
Above 65 octane number	2.875– 3.125	3.00 – 3.125	3.00 – 3.25
60-62 400 e.p. gasoline....	2.375– 2.625	2.50 – 2.625	2.50 – 2.625
NORTH TEXAS‡ (F. o. b. Wichita Falls district refineries for unrestricted shipment)			
U. S. Motor Gasoline			
Below 57 octane number	2.125– 2.375	2.25 – 2.375	2.25 – 2.50
57-65 octane number...	2.50 – 2.75	2.50 – 2.75	2.625– 2.75
Above 65 octane number	2.75 – 3.00	2.75 – 3.00	2.875– 3.125
60-62 400 e.p. gasoline...	2.25 – 2.50	2.375– 2.50	2.375– 2.625
64-66 375 e.p. gasoline...	2.75 – 2.875	2.75 – 3.00	2.875– 3.00
68-70 350-360 e.p. gasoline	2.875– 3.00	2.875– 3.125	3.00 – 3.125
WEST TEXAS‡ (F. o. b. West Texas refinery for unrestricted shipment)			
U. S. Motor Gasoline			
Below 57 Octane number	2.125– 2.375	2.25 – 2.375	2.25 – 2.50
57-65 Octane number...	2.50 – 2.75	2.50 – 2.75	2.625– 2.75
Above 65 Octane number	2.75 – 3.00	2.75 – 3.00	2.875– 3.125
EAST TEXAS‡ (F. o. b. East Texas refineries for unrestricted shipment)			
U. S. Motor Gasoline			
Below 57 octane number	1.875– 2.125	1.875– 2.125	2.00 – 2.125
57-65 octane number..	2.25 – 2.50	2.25 – 2.50	2.375– 2.50
Above 65 octane number	2.50 – 2.75	2.50 – 2.75	2.50 – 2.75
NORTH LOUISIANA (For Louisiana and Arkansas destination)			
U. S. Motor Gasoline			
Below 57 Octane number	2.75	2.75	2.75
57-65 Octane number..	3.125	3.125	3.125
Above 65 Octane number	3.375	3.375	3.375
ARKANSAS (For Arkansas and Louisiana destination)			
U. S. Motor Gasoline			
Below 57 Octane number	2.75	2.75	2.75
57-65 Octane number..	3.125	3.125	3.125
Above 65 Octane number	3.375	3.375	3.375

‡Refiners generally receive 0.25c to 0.5c per gallon more for gasoline and kerosine for local or differential territory shipment.

†Prices Nominal. ††Only one refiner Quoting. *Quotations only.

	Prices April 3	Prices March 27	Prices March 20
CALIFORNIA (3c tax to be added to California gasoline prices if used in state.)			
54-58 U.S. Motor 437 e.p.	4.50 – 6.00	4.25 – 6.00	4.50 – 6.00
54-58 U.S. Motor, 437 e.p., for outside state shipment	4.25 – 5.25	4.25 – 5.25	4.25 – 5.25
42-45 Engine Distillate 445-480 e.p.....	3.75 – 5.00	4.50 – 5.50	4.50 – 5.75

NATURAL GASOLINE

OKLAHOMA (F. o. b. Group 3)			
Grade 26-70.....	1.375	1.375	1.625
NORTH TEXAS (F. o. b. Breckenridge)			
Grade 26-70.....	1.375	1.375	1.625
CALIFORNIA (F. o. b. California refineries)			
75-85, 375-390 e.p. for blending.....	3.50 – 4.00	3.75 – 4.00	3.75 – 4.00

BURNING OILS

PENNSYLVANIA (F. o. b. Western Pennsylvania refineries)			
45 w.w. kerosine.....	4.375– 4.50	4.375– 4.625	4.375– 4.625
46]w.w. kerosine.....	4.50 – 4.75	4.50 – 4.75	4.625– 4.75
47 w.w. kerosine.....	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
OKLAHOMA (F. o. b. Oklahoma refineries)			
41-43 w.w. kerosine.....	2.375– 2.625	2.375– 2.625	2.375– 2.625
42-44 w.w. kerosine.....	2.50 – 2.75	2.50 – 2.75	2.50 – 2.75
KANSAS (F. o. b. refinery Kansas destination)			
41-43 w.w. kerosine.....	2.625– 2.75	2.625– 2.75	2.625– 2.75
42-44 w.w. kerosine.....	2.75 – 2.875	2.75 – 2.875	2.75 – 2.875
NORTH TEXAS‡ (F. o. b. Wichita Falls district refineries for unrestricted shipment)			
41-43 w.w. kerosine.....	2.375– 2.625	2.375– 2.625	2.375– 2.625
NORTH LOUISIANA‡ (For Louisiana and Arkansas destination)			
41-43 w.w. kerosine.....	2.875– 3.125	2.875– 3.125	3.00 – 3.25
ARKANSAS‡ (For Louisiana and Arkansas destination)			
41-43 w.w. kerosine.....	3.25	3.25	3.50
CALIFORNIA (F. o. b. California refineries)			
38-40 w.w. kerosine.....	3.50 – 4.25	3.75 – 4.00	3.75 – 4.25

NEUTRAL OIL

PENNSYLVANIA (F. o. b. Western Pennsylvania refineries)

Vis.	Viscous Neutrals (Viscosity at 70° F.)		
200 (180 at 100) No. 3 color 420-425 flash:			
Zero pour test.....	14.75 –15.00	14.75 –15.00	14.75 –15.00
10 pour test.....	14.00 –14.50	14.00 –14.50	14.00 –14.50
15 pour test.....	12.75 –13.00	12.75 –13.00	12.75 –13.00
25 pour test.....	12.00 –12.50	12.00 –12.50	12.00 –12.50
180 No. 3 color, 410-415 flash:			
25 pour test.....	10.50 –11.00	10.50 –11.00	10.50 –11.00
150 No. 3 color, 400-405 flash:			
Zero pour test.....	10.75 –11.25	10.75 –11.25	10.75 –11.25
10 pour test.....	10.50 –11.00	10.50 –11.00	10.50 –11.00
15 pour test.....	8.75 – 9.00	8.75 – 9.00	8.75 – 9.00
25 pour test.....	7.75 – 8.00	7.75 – 8.00	7.75 – 8.00

Refinery Markets Wax, Lubricants, Heavy Oil

Prices given below are in cents per gallon, except where $ is shown in tank car lots, f.o.b. Refinery. They represent prices made only to domestic jobbers who resell to the consuming public, except where otherwise noted. Tank car prices do not include state or federal taxes levied on some products.

(For quick reference to Refinery Prices, get the OIL PRICE HANDBOOK, published annually)

****MID-CONTINENT** (F. o. b. Mid-Continent Refineries)

Vis.	Color	Prices April 3 (Viscosity at 100° F.) 0 to 10 Pour Point	Prices April 3 (Viscosity at 100° F.) 15 to 30 Pour Point	Prices March 27 (Viscosity at 100° F.) 0 to 10 Pour Point	Prices March 27 (Viscosity at 100° F.) 15 to 30 Pour Point
100	No. 2	4.50	4.00	4.50	4.00
150	No. 3	6.50	6.00	6.50	6.00
150	No. 4	6.25	5.75	6.25	5.75
180	No. 3	7.75	7.25	7.75	7.25
180	No. 4	7.50	7.00	7.50	7.00
180	No. 5	7.25	6.75	7.25	6.75
200	No. 3	8.25	7.50	8.25	7.50
200	No. 4	8.00	7.25	8.00	7.25
200	No. 5	7.75	7.00	7.75	7.00
220	No. 3	9.25	8.75	9.25	8.75
220	No. 4	9.00	8.50	9.00	8.50
220	No. 5	8.75	8.25	8.75	8.25
240	No. 3	10.25	9.50	10.25	9.50
240	No. 4	10.00	9.25	10.00	9.25
240	No. 5	9.75	9.00	9.75	9.00
280	No. 3	11.25	10.50	11.25	10.50
280	No. 4	10.75	10.25	10.75	10.25
280	No. 5	10.50	10.00	10.50	10.00

SOUTH TEXAS (F. o. b. South Texas refineries)

Vis.	Color	Prices April 3 (Viscosity at 100° F., pour test 0)	Prices March 27 (Viscosity at 100° F., pour test 0)	Prices March 20 (Viscosity at 100° F., pour test 0)
200	No. 3 Pale	5.50 – 6.00	5.50 – 6.00	5.50 – 6.00
300	No. 3 Pale	6.00 – 6.50	6.00 – 6.50	6.00 – 6.50
500	No. 3½ Pale	7.00 – 7.50	7.00 – 7.50	7.00 – 7.50
750	No. 4 Pale	8.00	8.00	8.00
1200	No. 4 Pale	9.00	9.00	9.00
200	No. 5½ Red Oil	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50
300	No. 5½ Red Oil	5.50 – 6.00	5.50 – 6.00	5.50 – 6.00
500	No. 6 Red Oil	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00
750	No. 6 Red Oil	7.50	7.50	7.50
1200	No. 5-6 Red Oil	8.50	8.50	8.50

Note: Red oil prices shown above cover oils with blue cast; one or two refiners ask 0.5c to 1c per gallon higher for green cast red oils.

CALIFORNIA (F. o. b. California refineries)

Vis.	Color	(Viscosity at 100° F.)		
100	No. 3	10.50	10.50	10.50
150	No. 3	10.50	10.50	10.50
200	No. 3	11.00	11.00	11.00
300	No. 3	11.50	11.50	11.50
450	No. 3	12.25	12.25	12.25
500	No. 3	12.50	12.50	12.50
550	No. 3	12.75	12.75	12.75
600	No. 3	12.75	12.75	12.75
100	No. 5	10.00	10.00	10.00
200	No. 5	10.50	10.50	10.50
300	No. 5	11.00	11.00	11.00
400	No. 5	11.50	11.50	11.50
500	No. 5	12.00	12.00	12.00
600	No. 5	12.25	12.25	12.25
700	No. 7	12.50	12.50	12.50
800	No. 7	12.50	12.50	12.50

CYLINDER STOCKS

MID-CONTINENT (F. o. b. Mid-Continent refineries)
(Prices represent quotations and sales).

	Prices April 3	Prices March 27	Prices March 20
190-200 Vis. D at 210° Brt. St.	15.25	15.25	15.25
150-160 Vis. D at 210° Brt. St.:			
0-10 cold test	12.75 –13.25	12.75 –13.25	13.25
10-25 cold test	12.25 –12.75	12.25 –12.75	12.75
25-40 cold test	11.75 –12.25	11.75 –12.25	12.25
150-160 Vis. E 210° Brt. St.	11.75 –12.25	11.75 –12.25	12.25
600 St. Ref. Olive Green	4.00 – 5.50	4.00 – 5.50	4.00 – 5.50
600 St. Ref. Dark Green	3.50 – 4.50	3.50 – 4.50	3.50 – 4.50
630 Steam Refined	7.00	7.00	7.00
Black Oil	2.375– 2.50	2.375– 2.50	2.375– 2.50

PENNSYLVANIA (F. o. b. Western Penn. refineries) (A.S.T.M. Tests)

600 Steam Refined	7.25 – 8.00	7.25 – 8.00	7.25 – 8.00
650 Steam Refined	10.00 –11.00	10.00 –11.00	10.00 –11.00
600 Flash	11.50 –12.00	11.50 –12.00	11.50 –12.00
630 Flash	16.50 –17.00	16.50 –17.00	16.50 –17.00
600 Warren E	12.00 –12.50	12.00 –12.50	12.00 –12.50
Bright Stock, No. 8 color, 140-150 vis. at 210°, 540-550 flash:			
10 pour test	18.50 –19.00	18.50 –19.00	19.00 –19.50
15 pour test	16.50 –17.00	16.50 –17.00	17.00 –17.50
25 pour test	15.50 –16.00	15.50 –16.00	16.00 –16.50

††Only one refiner quoting. †Prices Nominal.

WAX

PENNSYLVANIA (Per pound, F. o. b. New York)

	Prices April 3	Prices March 27	Prices March 20
122-124 white crude scale a.m.p.	2.00 – 2.05	2.00 – 2.05	1.95 – 2.00
124-126 white crude scale a.m.p.	2.05 – 2.125	2.05 – 2.125	2.00 – 2.125

****OKLAHOMA** (Per pound in barrels; in a few instances, per pound in burlap bags; F. o. b. Oklahoma refineries.)

124-126 White Crude Scale, a.m.p.	1.625– 1.75	1.70 – 1.875	1.70 – 1.875

GAS AND FUEL OIL

PENNSYLVANIA (For outside Pittsburgh district)

36-40 fuel oil	3.25 – 3.50	3.25 – 3.50	†3.25 – 3.75

OKLAHOMA (F. o. b. Oklahoma refineries)

38-40 straw Furnace Oil	1.75 – 2.00	1.875– 2.00	1.875– 2.00
32-36 straw gas oil	1.00 – 1.25	1.00 – 1.25	1.00 – 1.25
32-36 straw gas oil zero	1.75 – 2.00	1.875– 2.00	2.00 – 2.125
32-36 dark gas oil	1.00 – 1.125	1.00 – 1.125	1.00 – 1.125
32-36 dark gas oil zero	1.75 – 1.875	1.75 – 2.00	1.875– 2.00
28-30 fuel oil, zero (per bbl.)	$0.70 –$0.75	$0.70 –$0.75	$0.70 –$0.75
28-30 fuel oil (per bbl.)	$0.475–$0.525	$0.475–$0.525	$0.50 –$0.55
24-26 fuel oil (per bbl.)	$0.35 –$0.45	$0.35 –$0.45	$0.35 –$0.45
22-26 fuel oil (per bbl.)	$0.35 –$0.375	$0.35 –$0.375	$0.35 –$0.40
18-22 fuel oil (per bbl.)	†$0.325–$0.375	†$0.325–$0.375	†$0.35 –$0.425
16-20 fuel oil (per bbl.)	$0.325–$0.35	$0.325–$0.35	$0.35 –$0.375
14-16 fuel oil (per bbl.)	†$0.325–$0.35	†$0.30 –$0.35	†$0.35 –$0.375

KANSAS (F. o. b. refinery Kansas destination)

38-40 straw Furnace Oil	2.00 – 2.125	2.125– 2.25	2.125– 2.25
18-22 fuel oil (per bbl.)	$0.45 –$0.50	$0.45 –$0.50	$0.45 –$0.475
10-14 fuel oil (per bbl.)	$0.375–$0.425	$0.40 –$0.425	$0.375–$0.40

NORTH TEXAS (F. o. b. Wichita Falls district refineries for unrestricted shipment)

38-40 straw Furnace Oil	1.875– 2.00	1.875– 2.00	1.875– 2.00
38-40 prime white Furnace Oil	1.875– 2.125	1.875– 2.125	2.00 – 2.125
32-36 gas oil, zero	1.75 – 1.875	1.875– 2.00	1.875– 2.125
32-36 gas oil	1.00 – 1.125	1.00 – 1.125	1.00 – 1.125
24-26 fuel oil (per bbl.)	$0.425–$0.475	$0.425–$0.475	$0.425–$0.475
18-22 fuel oil (per bbl.)	$0.35 –$0.40	$0.375–$0.425	$0.375–$0.425

WEST TEXAS (F. o. b. West Texas refineries for unrestricted shipment)

30-32 gas oil	1.875– 2.00	2.00 – 2.125	2.125– 2.25
18-22 fuel oil (per bbl.)	$0.50	$0.50	$0.50

NORTH LOUISIANA (For Louisiana and Arkansas destination)

32-36 gas oil	2.25 – 2.375	2.25 – 2.375	2.50
32-36 gas oil, zero	2.50 – 2.75	2.50 – 2.75	2.75
14-16 fuel oil (per bbl.)	$0.35 –$0.40	$0.35 –$0.40	$0.35 –$0.375

ARKANSAS (For Arkansas and Louisiana destination)

32-36 gas oil	2.25	2.25	2.50
32-36 gas oil, zero	2.50	2.50	2.75
28-30 gas oil, zero	2.25	2.25	2.50
20-24 fuel oil (per bbl.)	$0.45 –$0.475	$0.45 –$0.475	$0.45 –$0.475
9-12 fuel oil (per bbl.)	$0.35 –$0.375	$0.35 –$0.375	$0.35 –$0.375

CALIFORNIA (F. o. b. refinery)

14-18 fuel oil (per bbl.)	$0.35 –$0.45	$0.38 –$0.45	$0.38 –$0.45
14-18 Bunker oil (per bbl.)	$0.50 –$0.55	$0.50 –$0.60	$0.50 –$0.60
30-34 gas oil (per bbl.)	$0.85 –$0.95	$0.85 –$0.90	$0.90 –$0.95
27 Plus Diesel oil (per bbl.)	$0.80 –$0.95	$0.80 –$0.90	$0.85 –$0.90

PETROLATUMS

PENNSYLVANIA (Per pound, in barrels, carload lots, f. o. b. Penna refinery. In tank cars ⅜c to ¾c per pound less.) Quotations are from majority of refiners.

Snow White	6.25 – 6.50	6.25 – 6.50	6.25 – 6.50
Lily White	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50
Cream White	4.125– 4.50	4.125– 4.50	4.125– 4.50
Light Amber	2.25 – 2.50	2.25 – 2.50	2.25 – 2.50
Amber	2.00 – 2.25	2.00 – 2.25	2.00 – 2.25
Red	1.875– 2.00	1.875– 2.00	1.875– 2.00

Quotations only. **Prices represent quotations and sales.

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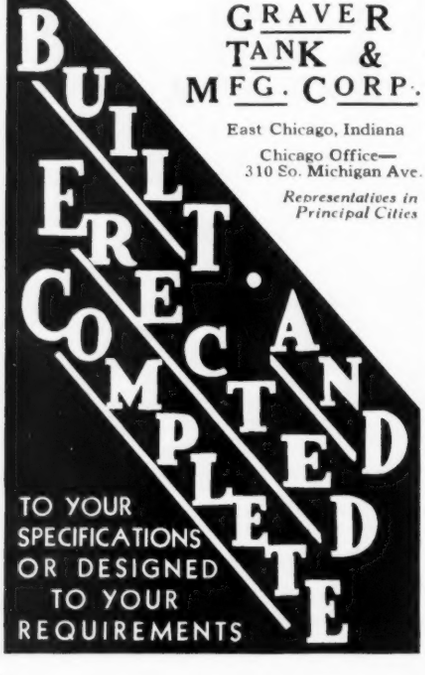

GRAVER TANK & MFG. CORP.

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Eastern Domestic Markets

Retail Cash Discounts Unsettle Gasoline

Staff Special

NEW YORK, April 1

EASTERN gasoline markets were unsettled throughout the week ended April 1. A more buoyant opinion prevailed among the trade based on the possibility of a production holiday but that prospect soon lost its force. Buying in the wholesale markets continued slow, particularly in the burning oil markets which have been a bright spot in weeks past. Retail gasoline markets in several directions were advanced but a string was tied to the improvement. A 2-cent discount for cash became a new policy at more points.

On March 26 the Standard Oil Co. of New York advanced tank wagon and service station prices 1 cent in Connecticut, Rhode Island and most of Massachusetts. Buffalo also was advanced 1 cent. But at the same time posted prices were advanced, a policy of giving 2 cents off posted service station price for cash was inaugurated. As most of the station business is for cash, the net result is a reduction of 1 cent. Dealers were generally protected by wider discounts.

Tank car trading in the New York and Baltimore markets was uneventful. Purchasing was on a hand-to-mouth basis at unchanged prices. Low and high octane grades were offered at 4.5 and 4.75 cents, respectively, in both markets. Quantities involved were comparatively small.

Philadelphia suppliers generally advanced quotations 0.25 cent early in the week but had little business to support the higher structure. However, suppliers were standing by their quotations.

New England spot markets were dull with tank car prices remaining generally unchanged at 4.75 and 5 cents for the two grades of gasoline. Spot buying was discouraged at many points by the cash discount policy which was rather generally adopted.

Bunker oil, Grade C, and diesel oil postings remained unchanged at $0.75 and $1.65 per barrel, respectively. Generally, this market was steady at these prices. However, to meet competition of oil in foreign markets the concession to large marine buyers at New York harbor was again revived after a short withdrawal of the policy. A concession of 5 cents per barrel was put into effect on March 26. The concession made previously was 10 cents per barrel.

Conditions prevailing in Texas offered little inducement for cargo traders at the Gulf. Crude oil in cargo lots was offered freely for prompt lifting at $0.55 per barrel, f.o.b. the Gulf. Quotations on gasoline and gas oil were lagely nominal. Bunker oil was steady at $0.50 per barrel despite the disturbance in the crude oil markets. Panuco crude was offered at $0.42 per barrel, f.o.b. Tampico.

Companies interested in European oil markets were in conference in London early in the week. It was reported that unsold quantities held by Roumanian suppliers at the end of the first quarter would be absorbed. Prices for the second quarter were being held in abeyance pending further developments in the American Gulf market. However, Roumanian suppliers were prepared to quote gasoline comparable to 64-66, 375 end point gasoline at 3.5625 cents American Gulf basis or 3.875 f.o.b. Constanza. California suppliers negotiated some business on the basis of 3.625 cents f.o.b. Gulf.

American suppliers of gasoline and kerosine in cases reduced their prices 25 cents on gasoline, and 15 to 20 cents on kerosine. The new schedule is $1.25 for U. S. Motor; $1.35 for 64-66, 375 e.p., $1.20 for water white kerosine and $1.15 for prime white kerosine. These prices are for cargo lots, f.o.b. the Gulf.

Wax Markets

Scale Steadier; Fully Refined Prices Sag

NEW YORK, April 1.—A mixed trend developed in wax markets during the past week. Scale waxes, which have been unsteady in export trade circles in past weeks, were tighter during recent trading. A shortage in supply was reported by many of the trade. On the other hand, prices for the fully refined grades sagged noticeably in a market which had previously been quite steady.

Brisk competition and excess stocks at New Orleans brought about lower quotations on the fully refined grades. The intermediate melting point grades, that is 123 to 130 A.M.P. were shaded 0.125 cent per pound. Inquiries from South America and the United Kingdom for small lots constituted the principal centers of interest.

New York suppliers of fully refined grades were reticent about lowering prices. Many stated that New Orleans competition was difficult to meet. Domestic prices also were subjected to shading which generally amounted to about 5 points.

Complete Seaboard Markets

Prices on this page do not include federal tax levied on some products

Eastern Domestic Markets

(Prices for tank car lots, f. o. b. refinery or seaboard terminal, representing majority of sales and quotations to jobbers and/or consumers. Florida and S. Carolina inspection tax not included.

	Prices April 3	Prices March 27	Prices March 20
U. S. MOTOR GASOLINE: Below 65 Octane Number			
New York harbor	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
Portland district	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50
Boston district	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
Providence district	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
Philadelphia district	4.75 – 5.00	4.75 – 5.00	4.50 – 4.75
Baltimore district	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
Norfolk district	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50
Charleston district	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50
Savannah district	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50
Jacksonville district	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50
MOTOR GASOLINE: 65 Octane Number and Above			
New York harbor	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
Portland district	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75
Boston district	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25
Providence district	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25
Philadelphia district	5.00 – 5.25	5.00 – 5.25	4.75 – 5.00
Baltimore district	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
Norfolk district	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75
Charleston district	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75
Savannah district	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75
Jacksonville district	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75
AVIATION GASOLINE: Below 73 Octane Number			
New York harbor	8.50 – 9.50	8.50 – 9.50	8.50 – 9.50
Philadelphia	8.50 – 9.50	8.50 – 9.50	8.50 – 9.50
Baltimore	8.50 – 9.50	8.50 – 9.50	8.50 – 9.50
Boston	8.50 – 9.50	8.50 – 9.50	8.50 – 9.50
73 Octane Number and Above (Test basis 300° F.; 600 R.P.M.)			
New York harbor	11.00 –12.00	11.00 –12.00	11.00 –12.00
Philadelphia	11.00 –12.00	11.00 –12.00	11.00 –12.00
Baltimore	11.00 –12.00	11.00 –12.00	11.00 –12.00
Boston	11.00 –12.00	11.00 –12.00	11.00 –12.00
WATER WHITE KEROSINE			
New York harbor	5.25	5.25	5.25
Philadelphia district	5.50	5.50	5.50
Baltimore district	5.50	5.50	5.50
Norfolk district	5.25	5.25	5.25
Charleston district	5.25	5.25	5.25
Boston district	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25
Savannah district	5.25	5.25	5.25
Jacksonville district	5.25	5.25	5.25
Portland district	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50
Providence district	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25
BURNING OILS:			
New York harbor:			
Furnace oil No. 1	5.00	5.00	5.00
Heating oil No. 2	4.00	4.00	4.00
Distillate oil No. 3	4.00	4.00	4.00
Industrial oil No. 4	3.50	3.50	3.50
Philadelphia district:			
Furnace oil No. 1	5.00	5.00	5.00
Heating oil No. 2	4.00	4.00	4.00
Distillate oil No. 3	3.50	3.50	3.50
Boston district:			
Furnace oil No. 1	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
Heating oil No. 2	4.00	4.00	4.00
Distillate oil No. 3	3.75	3.75	3.75
Industrial oil No. 4	3.50	3.50	3.50

	Prices April 3		
	*Bunker Oil Grade C	Diesel Oil Ships' Bunkers	Gas Oil 28-34 Gravity
New York Harbor	$0.75	†$1.65	4.00
Philadelphia district	0.75	1.65	4.00
Baltimore district	0.75	1.65	4.00
Norfolk district	0.75	1.65	....
Charleston district	0.70	1.65	....
Savannah district	0.70	†1.65	....
Jacksonville district	0.70	†1.65	....
Portland district	0.80	1.75	....
Boston district	0.75	1.65	....
Providence district	0.75	1.65	....

*Lighterage 5c per bbl. additional. †At shore plants, 4.00c per gal.

New York Export Markets

(Prices in cents per gallon in barrels, F. a. s. New York)

	Prices April 3		
CYLINDER OILS (Pennsylvania Products)			
Bright stock, No. 8 color	22.00 –23.00	22.00 –23.00	22.00 –23.00
Bright stock, No. 6½ color diluted	21.00 –22.00	21.00 –22.00	21.00 –22.00
600 Warren E filtered	17.00 –18.00	17.00 –18.00	17.00 –18.00
600 stm. refd, unfiltered	13.00 –14.00	13.00 –14.00	13.00 –14.00
650 stm. refd. unfiltered	15.25 –16.00	15.25 –16.00	15.25 –16.00
600 flash steam refined	15.50 –16.50	15.50 –16.50	15.50 –16.50
630 flash, steam refined	20.50 –21.50	21.00 –22.00	21.00 –22.00

Wax Market

(Prices in cents per pound. Tests made by A. S. T. M. method with melting points converted into A. M. P. by adding 3° F. Export prices are f.a.s. carload lots. Domestic prices are f.o.b. refineries in New York and New Orleans harbor district, in bags, carload lots, with 0.2c discount allowed for shipment in bulk).

	Prices April 3	
NEW YORK	**Domestic**	**Export**
124-126 Yellow Crude scale	1.85 – 1.90	1.85 – 1.90
122-124 White Crude scale	1.90 – 2.00	1.90 – 2.00
124-126 White Crude scale	1.95 – 2.00	1.95 – 2.00
123-125 Fully refined	3.10	2.50
125-127 Fully refined	3.20	2.625
128-130 Fully refined	3.45	3.00
130-132 Fully refined	3.60	3.125
133-135 Fully refined	4.20	4.00
135-137 Fully refined	4.45	4.125

	Prices April 3	
NEW ORLEANS	**Domestic**	**Export**
124-126 Yellow Crude scale	1.85 – 1.90	1.85 – 1.90
122-124 White Crude scale	1.90 – 2.00	1.90 – 2.00
124-126 White Crude scale	1.95 – 2.00	1.95 – 2.00
123-125 Fully refined	3.05 – 3.10	2.375– 2.50
125-127 Fully refined	3.15 – 3.20	2.50 – 2.625
128-130 Fully refined	3.40 – 3.45	2.75 – 3.00
130-132 Fully refined	3.55 – 3.60	2.875– 3.125
133-135 Fully refined	4.15 – 4.20	3.875– 4.00

Gulf Coast Bulk Market

(Prices are f. o. b. Gulf oil terminals representing sellers' opinions except prices specified to the contrary. Prices cover bulk shipments of 20,000 barrels or more, unless otherwise noted.)

	April 3	March 27	March 20
U. S. MOTOR GASOLINE: For Domestic Shipment			
Below 65 octane number	3.25 – 3.50	3.25 – 3.50	3.25 – 3.50
65 octane and above	3.50 – 3.75	3.75 – 4.00	3.75 – 4.00
KEROSINE			
41-43 w.w.	3.625– 3.875	3.625– 3.875	3.625– 3.875
For Export Shipment			
GASOLINE			
U. S. Motor gasoline	3.25 – 3.50	3.25 – 3.50	3.25 – 3.50
60-62, 400 e.p. gasoline	3.50 – 3.625	3.50 – 3.625	3.50 – 3.625
61-63, 390 e.p. gasoline	3.625– 3.875	3.625– 3.875	3.625– 3.875
64-66, 375 e.p. gasoline	3.625– 3.875	3.75 – 4.00	3.75 – 4.00
U. S. Motor, cases (cargoes)	$1.25	$1.50	$1.50
64-66 cases (cargoes)	$1.35	$1.60	$1.60
KEROSINE			
41-43 water white	3.625– 3.875	3.625– 3.875	3.625– 3.875
41-43 prime white	3.50 – 3.75	3.50 – 3.75	3.50 – 3.75
W.W., cases (cargoes)	$1.20	$1.40	$1.40
P.W., cases (cargoes)	$1.15	$1.30	$1.30
(For Domestic and/or Export Shipment)			
GAS and BUNKER OILS			
*26-30 translucent gas oil	3.00	3.00	3.00
*30 plus translucent gas oil	3.25	3.25	3.25
Diesel Oil ships' bunkers	$1.50	$1.50	$1.50
Grade C bunker oil, for ships' bunkers, per bbl.	$0.60	$0.60	$0.60
Grade C bunker oil, per bbl. in cargoes	$0.50 –$0.55	$0.50 –$0.55	$0.45 –$0.50

*Less than ½ of 1% sulphur.

MEXICAN CRUDE AND BUNKER OILS (f.o.b. Steamer, Tampico)			
Heavy Panuco crude taxes to be paid, per bbl.	$0.42 –$0.45	$0.45	$0.45
Grade C for bunkering, taxes paid, per bbl.	$0.60	$0.60	$0.60

SOUTH TEXAS LUBRICATING OILS (Viscosity at 100° F. cold test 0 Tanker, f. o. b. Gulf oil terminals.)

200 vis. No. 3 unfilt. pale	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
300 vis. No. 3 unfilt. pale	5.375– 6.00	5.375– 6.00	5.375– 6.00
500 vis. No. 3½ unfilt. pale	6.25 – 7.00	6.25 – 7.00	6.25 – 7.00
750 vis. No. 4 unfilt. pale	7.25 – 7.75	7.25 – 7.75	7.25 – 7.75
1200 vis. No. 4 unfilt. pale	8.50 – 9.00	8.50 – 9.00	8.50 – 9.00
200 vis. No. 5-6 red oil	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00
300 vis. No. 5-6 red oil	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50
500 vis. No. 5-6 red oil	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00
750 vis. No. 5-6 red oil	6.75 – 7.125	6.75 – 7.125	6.75 – 7.125
1200 vis. No. 5-6 red oil	7.75 – 8.25	7.75 – 8.25	7.75 – 8.25

Note: Red oil prices shown above cover oils with blue cast; one or two refiners ask 0.5c to 1c per gal. higher for green cast red oils.

Pacific Export Market

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gallon, except where otherwise noted.)

53-55 U. S. Motor	3.50 – 4.00	3.50 – 4.00	3.50 – 4.00
400 e.p. blend 65 Octane and above	4.00 – 4.50	4.00 – 4.50	4.00 – 4.50
Gas oil, 30-34 per bbl.	$0.85 –$0.95	$0.85 –$0.95	$0.85 –$0.95
Diesel oil, 27 plus, per bbl.	$0.85 –$0.90	$0.85 –$0.90	$0.85 –$0.90
Bunker oil, 14-18 per bbl.	$0.60 –$0.72	$0.60 –$0.72	$0.60 –$0.72
Fuel oil, 14-18 per bbl.	$0.50 –$0.60	$0.50 –$0.60	$0.50 –$0.60
38-40 w.w. kero., 150 fire	3.75 – 4.25	3.75 – 4.25	3.75 – 4.25
Cased Goods			
Gasoline, U. S. Motor	$1.45 –$1.60	$1.45 –$1.60	$1.45 –$1.60
Gasoline, 400 e.p. blend	$1.55 –$1.70	$1.55 –$1.70	$1.55 –$1.70
38-40 w.w. kero., 150 fire	$1.25 –$1.35	$1.25 –$1.35	$1.25 –$1.35
Kerosine, prime white	$1.05 –$1.20	$1.05 –$1.20	$1.05 –$1.20

Tanker Rates

(Approximate tanker freight rates to Continental ports, in shillings per ton of 2240 pounds, British sterling; to U. S. ports, cents per barrel)

	April 3			
	Crude &/or Fuel Last Paid	Crude &/or Fuel Owners Ask	Refined Oil &/or Spirits Last Paid	Refined Oil &/or Spirits Owners Ask
Calif.-U.K./Continent*	12/6	15/-20/	18/	18/-19/
Gulf-U.K./Continent*	8/6	8/6-9	8/9	9/-10/
Calif.-N. Atlantic (not E. of N. Y.)	42c	40-45c	41c	40-45c
Gulf-N. Atlantic** (not E. of N. Y.)	14	15-16c	15c	15-18c

*Continental portsi n range between Bordeaux and Hamburg, both inclusive
**Venezuela loading same rate; Tampico 2 to 3c per bbl. additional.

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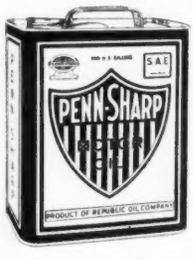
Permit No. 765



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Pennsylvania Markets

Trading Featureless

CLEVELAND, April 3.—The western Pennsylvania refinery market was featureless in the week ended April 1. Motor oils were in fair demand and wax was active. Other products were lifeless.

There were widespread reports of 15.5 cents being shaded on 25 pour test bright stock but actual sales in the open market at under this price could not be confirmed. Buyers in some parts of the country have shown a tendency to confuse open market prices with prices obtaining in the many contracts which are said to have been written on the basis of substantially under open market published prices.

Refiners generally have expected increased buying of lubricating oils to materialize around April 1, although the opinion now prevails in some quarters that a substantial increase will be delayed by the restricted banking situation which continues in some areas.

While stocks of lubricating oils are ample, refiners generally appear more disposed to hold their material until buying does materialize rather than to sell at prices which, for many of them, are unprofitable.

Demand for wax for domestic shipment continued good last week and prices held fairly well at the higher levels established recently. Several refiners reported last week that they were booked up 30 to 60 days ahead.

Gasoline, kerosine and fuel oil were quiet but prices showed little change. Blending naphthas were offered 0.125 to 0.25 cent lower.

New Company To Build Refinery In Alberta

TORONTO, April 3.—A new company has been organized in Alberta to build and operate a 250-barrel refinery at Calgary, costing $75,000. It is the Federated Oil Consumers, Ltd., and has been incorporated under the Co-operative Societies Act of Alberta, according to Harold J. Maloney, provisional chairman of the board of trustees.

Provisional trustees are: Harold J. Maloney, chairman; W. A. McLean, secretary; and A. F. Johnston. Organizers are: W. N. Ladd, E. J. Burke and R. A. Johnston. D. Austin Jones-Lane is solicitor.

Crude will be obtained from independent operators in the Turner Valley field and from Montana, according to reports.

Products of the company will be marketed co-operatively. The company has powers to engage in building and operating of service and bulk stations.

Tank Wagon, Service Station Markets for Gasoline and Kerosine

(OIL PRICE HANDBOOK has t.w. and s.s. markets for a whole year, arranged for quick reference)

Tax column includes 1c federal tax, state gasoline tax, and city and county taxes as indicated in footnotes

These Prices in Effect April 3, 1933, as Posted by Principal Marketing Companies

Latest Changes in Tank Wagon Markets

Motor Gasoline

S. O. New Jersey—Standard t.w. and s.s. cut 0.2c, Mt. Airy, to 18.4c and 19.4c respectively, **March 23.**

S. O. New York—T.w. and s.s. up 1c, Buffalo, to 14.5c and 15.5c respectively, **March 29.**

T.w. and s.s. up 1c, Boston, to 14c and 15c, **March 27.**

T.w. and s.s. up 1c, Providence, to 13.5c and 14.5c respectively, **March 27.**

Atlantic Refining—T.w. and s.s. up 1c, Boston, Hartford and New Haven, to 14c and 15c respectively, **March 27.**

T.w. and s.s. up 1c, Providence, to to 13.5c and 14.5c, **March 27.**

T.w. and s.s. up 1c, Springfield, to 15.5c and 16.5c, **March 27.**

S. O. Ohio—X-70 t.w. and s.s. up 1c, thru state, to 15.5c and 16c, respectively, **March 30.**

Renown Green s.s. up 1c, thru state, 14c, **March 30.**

Discount changes: 1c per gallon discount off posted s.s. price to purchasers of all grades of gasoline for cash at company-owned or operated stations, thru Ohio, **March 30.** To commercial contract credit accounts, a 2c per gallon discount; dealers and commercial consumers from the tankwagon, who have been getting 2c off t.w. price for X-70 and 1.5c for Renown Green, get 1c additional for cash sales actually made by them, effective **March 30.**

S. O. Kentucky—Crown t.w. and s.s. up 2c, Birmingham, both to 19c **March 23;** up 2c, both to 21c, **March 28.**

Kyso Green: T.w. and s.s. up 2c, Birmingham, both to 16c, **March 23;** up 2c, both to 18c, **March 28.**

S. O. Indiana—Red Crown s.s. only, cut 2c, Evansville to 13c, **March 28.**

T.w. and s.s. cut 1c, Bartlesville, to 12.5c, and 15c respectively, **March 24.**

Stanolind s.s. cut 0.8c, Detroit, to 13.5c, **March 24;** and t.w. cut 0.8c to 13.5c, **March 25.**

S.s. only cut 1.5c, Evansville, to 10c, **March 28.**

S. O. Louisiana—Standard t.w. and s.s. cut 0.5c, Bristol, both to 18c, **March 25.**

Magnolia Petroleum — Correction: prices for Oklahoma City since Jan. 3 have been 11.5c t.w. and 14c s.s., including 5c state and federal taxes.

Continental Oil—Conoco t.w. and s.s. cut 2c, Boise, to 18.5c and 21.5c, respectively, **March 22.**

Third Grade: t.w. and s.s. cut 2c, Boise, to 17.5c and 18.5c **March 22.**

T.w. and s.s. cut 1c, Salt Lake City, to 14c and 15c, **March 24.**

S. O. California—Standard t.w. and s.s. up 1c, Fresno, to 14c and 17c, **March 28.**

T.w. and s.s. cut 1.5c Reno, to 17.5c and 20.5c, **March 28.**

T.w. and s.s. up 0.6c, Portland to 13c and 16c, **March 18.**

T.w. and s.s. up 0.6c, Seattle and Tacoma, to 14c and 17c, **March 18.**

Flight t.w. and s.s. up 0.5c, Fresno, to 12.5c and 13.5c, **March 28.**

T.w. and s.s. cut 2c, Reno, to 16c and 17c, **March 28.**

T.w. and s.s. up 0.6c, Portland, to 12c and 13c, **March 18.**

T.w. and s.s. up 0.6c, Seattle and Tacoma, to 13c and 14c, **March 18.**

Kerosine

S. O. Kentucky—Up 1c, Birmingham, to 13c t.w., **March 29.** Cut 1c, Tampa, to 12c t.w., **March 23.**

S.O. NEW JERSEY TERRITORY

	Standard Gasoline T.W.	Tax	Total T.W.	S.S.	Kerosine T.W.
Atlantic City, N. J.	10	4	14	15	11.2
Newark, N. J.	9.3	4	13.3	14.3	8.5
Annapolis, Md.	9.6	5	14.6	15.6	9
Baltimore, Md.	9	5	14	15	8
Cumberland, Md.	10.5	5	15.5	16.5	11.7
Washington, D. C.	9.2	3	12.2	13.2	10
Danville, Va.	10.7	6	16.7	17.7	10.9
Norfolk, Va.	9.1	6	15.1	16.1	10.3
Petersburg, Va.	10.2	6	16.2	17.2	11.4
Richmond, Va.	9.5	6	15.5	16.5	10.7
Roanoke, Va.	10.7	6	16.7	17.7	11
Charleston, W. Va.	10.4	5	15.4	16.4	11.6
Parkersburg, W. Va.	9	5	14	15	10.2
Wheeling, W. Va.	10	5	15	16	11.2
Charlotte, N. C.	10.3	7	17.3	18.3	12.5
Hickory, N. C.	11.5	7	18.5	19.5	12.7
Mt. Airy, N. C.	11.4	7	18.4	19.4	12.8
Raleigh, N. C.	11.1	7	18.1	19.1	12.3
Salisbury, N. C.	11	7	18	19	12.6
Charleston, S. C.	9.1	7	16.1	17.1	10.3
Columbia, S. C.	11	7	18	19	12.2
Spartanburg, S. C.	8	7	15	16	12.5

Acto Gasoline (Third Grade)

Newark, N. J.	4	....	12.3	8.5
Annapolis, Md.	5	....	13	9
Washington, D. C.	3	....	10	10
Norfolk, Va.	6	....	15	10.3
Parkersburg, W. Va.	5	....	11	10.2
Charlotte, N. C.	7	....	17	12.5
Raleigh, N. C.	7	....	15	12.3
Columbia, S. C.	7	....	16	12.2

Discounts: To dealers on Standard gasoline, 2c off retail t.w. price, except Washington, D. C. and Baltimore, Md., where discount is 3c.

To commercial consumers: on t.w. deliveries, over a year off posted retail t.w.: 1,000 to 20,000 gals., 2c per gal.; 20,001 to 100,000 gals., 2.5c; 100,001 to 300,000 gals., 3c; and over 300,000 gals., 3.5c.

Service station discount to commercial consumers: on Standard gasoline, 2c per gal. off s.s. price, thru territory, effective Jan. 19, 1933; subject to cancellation on 10 days' notice. Acto sold for cash only.

Kerosine Discount: 1c off t.w. price for 25 gals. or more, under contract thru territory except New Jersey, effective June 17, 1931.

S. O. NEW YORK

Socony Gasoline

Greater New York City: Boroughs of Manhattan, Bronx, Queens & Kings	9.5	4	13.5	13.5	9.5
Borough of Richmond	9.5	4	13.5	13.5	8.5
Albany, N. Y.	10	4	14	15	9
Buffalo, N. Y.	10.5	4	14.5	15.5	9
Rochester, N. Y.	10.5	4	14.5	15.5	9
Syracuse, N. Y.	11	4	15	16	9.5
Boston, Mass.	10	4	14	15	8
Augusta, Me.	12	5	17	18	9
Manchester, N. H.	11.5	5	16.5	17.5	8
Burlington, Vt.	12	5	17	18	8.5
New Haven, Conn.	11	3	14	15	8
Providence, R. I.	10.5	3	13.5	14.5	8

Dealer discount: on gasoline 2c off posted t.w. price, except 3c in New York City.

ATLANTIC REFINING

Atlantic White Flash Gasoline

Pittsburgh, Pa.	9.5	4	13.5	14.5	9
Philadelphia, Pa.	9.5	4	13.5	14	9
Allentown, Pa.	9.5	4	13.5	14.5	9
Erie, Pa.	9.5	4	13.5	14.5	9
Scranton, Pa.	9.5	4	13.5	14.5	9
Altoona, Pa.	9.5	4	13.5	14.5	9
Dover, Del.	9.5	4	13.5	14.5	9
Wilmington, Del.	9.5	4	13.5	14	9
Boston, Mass.	10	4	14	15	8
Springfield, Mass.	11.5	4	15.5	16.5	8
Worcester, Mass.	10.5	4	14.5	15.5	8
Fall River, Mass.	9.5	4	13.5	14.5	8
Providence, R. I.	10.5	3	13.5	14.5	8
Hartford, Conn.	11	3	14	15	8
New Haven, Conn.	11	3	14	15	8
Atlantic City, N. J.	10	4	14	15	11.2
Camden, N. J.	9.4	4	13.4	14.4	9.5

Above prices include these inspection fees on both gasoline and kerosine, per gallon, figured on basis of 50 gallons per barrel:

Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1/5c per gal. in a single barrel, 1/20c per gal. in bulk; Florida, 1/8c; Illinois, 3/100c; Indiana, 1/2c per gal. in a single barrel; 3/10c per gal. in lots of 2 to 10 bbls., 1/5c for 10 to 50 bbls., 2/25c for over 50 bbls.; Kansas, 1/50c, (3/50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 2/25c; Missouri, gasoline, 1.5c per bbl., in lots of 10 bbls. or more; Nebraska, 3/50c; NorthCarolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal. in lots of more than 50 bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee, 2/5c; and Wisconsin, 1/25c.

Kerosine inspection fees only: Iowa, 2/25c; Michigan, 4/5c per gal. for first 2 bbls.; 3/5c for next 3; 2/5c for next 5; 3/10c for next 15, and 1/5c per gal. in lots over 25 bbls.

Tank Wagon, Service Station Markets for Gasoline and Kerosine

Tax column includes 1c federal tax, state gasoline tax, and city and county taxes as indicated in footnotes

These Prices in Effect April 3, 1933, as Posted by Principal Marketing Companies

ATLANTIC REFINING (Cont'd)

Atlantic White Flash Gasoline

	T.W.	Tax	Total T.W.	S.S.	Kerosine T.W.
Trenton, N. J.	9.8	4	13.8	14.8	9.5
Annapolis, Md.	9.6	5	14.6	15.6	9
Baltimore, Md.	9	5	14	15	8
Hagerstown, Md.	8	5	13	14	10.4
Richmond, Va.	9.5	6	15.5	16.5	10.7
Wilmington, N. C.	9.2	7	16.2	17.2	10.4
Brunswick, Ga.	12	7	19	20	*12.5
Jacksonville, Fla.	10	8	18	19	11

Dealer discount: on gasoline "split dealers," 2c off posted t.w. price; to 100% dealers, 2.5c to authorized dealers (under lease 1c per gal.), 2.5c off posted s.s. price. Commercial accounts, under contract for one year, are sold at a discount off the posted prices, with due consideration to competition.

*Georgia kerosine prices include 1c state tax.

S. O. OHIO

Sohio X-70 Gasoline

Ohio statewide	10.5	5	15.5	16	11.5

Renown Green (Third Grade)

Ohio statewide	...	5	....	14	11.5

Dealer and commercial consumer discount: Sohio X-70, 2c off t.w. price and Renown Green, 1.5c off s.s price, plus 1c for cash sales actually made by them. Kerosine, 2.5c off t.w.

Cash discount at service stations (Company-owned or operated stations), to all customers, on all gasolines: 1c for cash off s.s. price; to commercial contract credit accounts, 2c off s.s. price, effective March 30, 1933.

Kerosine prices vary from statewide price in these counties: Defiance, Wood, Delaware, Union and Richmond, at 8c t.w.

S. O. KENTUCKY

Crown Gasoline

Lexington, Ky.	12.5	6	18.5	18.5	10
Louisville, Ky.	12	6	18	18	10
Paducah, Ky.	13	6	19	19	9
Covington, Ky.	12	6	18	18	11.5
Jackson, Miss.	9	7	16	16	*11
Vicksburg, Miss.	11	7	18	18	*9
Birmingham, Ala.	13	*8	21	21	13
Mobile, Ala.	13	*8	21	21	8
Montgomery, Ala.	13	*9	22	22	*14
Macon, Ga.	13	7	20	20	*11
Atlanta, Ga.	13	7	20	20	*12
Augusta, Ga.	13	7	20	20	*12
Savannah, Ga.	13	7	20	20	*12.5
Jacksonville, Fla.	13	8	21	21	9.5
Miami, Fla.	13	8	21	21	12.5
Tampa, Fla.	12	8	20	20	12
Pensacola, Fla.	11	*9	20	20	12

Kyso Green (Third Grade)

Lexington, Ky.	9.5	6	15.5	15.5	10
Louisville, Ky.	8.5	6	14.5	14.5	10
Paducah, Ky.	9.5	6	15.5	15.5	9
Covington, Ky.	9	6	15	15	11.5
Jackson, Miss.	6	7	13	13	*11
Vicksburg, Miss.	7	7	14	14	*9
Birmingham, Ala.	10	*8	18	18	13
Mobile, Ala.	10	*8	18	18	8
Montgomery, Ala.	10	*9	19	19	*14
Atlanta, Ga.	10	7	17	17	*17
Augusta, Ga.	10	7	17	17	*11
Macon, Ga.	10	7	17	17	*11

Dealer Discount: on Crown and Crown Ethyl gasolines, 3c off t.w. price thru territory; Kyso Green 2c. Effective Nov. 21, in Jefferson county, Ala., including Birmingham, major oil companies give 2c per gal. off s.s. price for cash, to buyers at stations, in any quantity. Effective Jan. 14, 1933, 2c per gal. discount off s.s. price for cash at Louisville by S. O. Kentucky.

***Taxes:** in the tax columns are included these city and county taxes at the following points: Birmingham, 1c city; Mobile, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Mississippi kerosine prices include 1c state tax Montgomery kerosine price includes ½c city tax

S. O. INDIANA

Standard Red Crown Gasoline

Chicago, Ill.	10.1	4	14.1	14.1	8
Decatur, Ill.	11.6	4	15.6	15.6	10.1
E. St. Louis, Ill.	10.9	4	14.9	13.9	9.3
Joliet, Ill.	11.6	4	15.6	14.6	8.6
Peoria, Ill.	11.6	4	15.6	15.6	10.1
Quincy, Ill.	11.4	4	15.4	14.4	7.5
Springfield, Ill.	11.6	4	15.6	15.6	10.1
Indianapolis, Ind.	11.4	5	16.4	16.4	‡14.1
Evansville, Ind.	11.2	5	16.2	13	‡13.9
South Bend, Ind.	11.7	5	16.7	16.7	‡12.5
Detroit, Mich.	11	4	15	15	8
Grand Rapids, Mich.	11.5	4	15.5	15.5	8
Saginaw, Mich.	11.8	4	15.8	15.8	8
Marquette, Mich.	12.1	4	16.1	16.1	10.9
Green Bay, Wisc.	11.8	5	16.8	16.8	10.5

S. O. INDIANA (Cont'd)

Standard Red Crown Gasoline

	T.W.	Tax	Total T.W.	S.S.	Kerosine T.W.
Madison, Wisc.	11.5	5	16.5	16.5	10.2
Milwaukee, Wisc.	11.3	5	16.3	16.3	10
La Crosse, Wisc.	12.4	5	17.4	17.4	11.1
Minneapolis, Minn.	10.4	4	14.4	14.4	11
Duluth, Minn.	12.7	4	16.7	16.7	11
Mankato, Minn.	12.3	4	16.3	16.3	8.1
Des Moines, Ia.	11.7	4	15.7	15.7	8
Davenport, Ia.	11.7	4	15.7	15.7	10.4
Sioux City, Ia.	11.3	4	15.3	15.3	10
Mason City, Ia.	11.7	4	15.7	15.7	9
St. Louis, Mo.	8.5	*3.5	12	11.5	9.4
Kansas City, Mo.	10.1	†4	14.1	14.1	7
St. Joseph, Mo.	6.9	†4	10.9	10.9	7.5
Fargo, N. D.	14.1	4	18.1	18.1	13.0
Grand Forks, N. D.	11	4	16	16	13.3
Minot, N. D.	14.1	4	18.1	18.1	12
Pierre, S. D.	12.2	5	17.2	17.2	11.5
Huron, S. D.	12.5	5	17.5	17.5	10
Wichita, Kans.	9.9	4	13.9	13.9	6
Bartlesville, Okla.	7.5	5	12.5	15	8

Note: Kerosine s.s. prices are generally 3c above normal t.w. price.

Stanolind prices are normally 1.5c per gal. under Standard Red Crown. Most of the following points are exceptions:

Stanolind Gasoline (Third Grade)

Chicago, Ill.	8.6	4	12.6	12.6	8
Decatur, Ill.	10.1	4	14.1	11.9	10.1
E. St. Louis, Ill.	9.4	4	13.4	11	9.3
Joliet, Ill.	9.5	4	13.5	13.5	8.6
Peoria, Ill.	9.6	4	13.6	13	10.1
Quincy, Ill.	7.8	4	11.8	11.8	7.5
Springfield, Ill.	10.1	4	14.1	12	10.1
Kansas City, Mo.	7	†4	11	11	7
St. Joseph, Mo.	5.9	†4	9.9	9.9	7.5
St. Louis, Mo.	7.5	*3.5	11	9.5	9.4
Detroit, Mich.	9.5	4	13.5	13.5	8
Grand Rapids, Mich.	10	4	14	13.5	8
Marquette, Mich.	10.6	4	14.6	14.6	10.9
Saginaw, Mich.	10.3	4	14.3	14.3	8
Mankato, Minn.	8.5	4	12.5	13	8.1
Minneapolis, Minn.	7.9	4	11.9	11.9	11
Evansville, Ind.	9.7	5	14.7	10	‡13.9
Indianapolis, Ind.	9	5	14	12.9	‡14.1
South Bend, Ind.	10.2	5	15.2	15.2	‡12.5
Davenport, Ia.	10.2	4	14.2	12	10.4
Des Moines, Ia.	7.9	4	11.9	11.9	8
Mason City, Ia.	7.6	4	11.6	12.6	9
Sioux City, Ia.	8	4	12	12	10
Green Bay, Wisc.	10.3	5	15.3	15.3	10.5
La Crosse, Wisc.	10.9	5	15.9	15	11.1
Madison, Wisc.	10	5	15	15	10.2
Milwaukee, Wisc.	7.5	5	12.5	12.5	10
Huron, S. D.	11	5	16	16	10
Fargo, N. D.	11.5	4	15.5	16.6	13
Grand Forks, N. D.	12	4	16	16	13.3
Wichita, Kan.	6	4	10	9	6
Bartlesville, Okla.	6	5	11	12	8

†Includes city tax of 1c. *Includes city tax of 0.5c. ‡Includes 4 cent state tax.

Q.D.A. (Effective May 4, 1931):

Discounts to resellers, except in Chicago, all quantities per month:

Off s.s. under 75,000 gals.: Ethyl: 3c, Red Crown 2.5c, Stanolind 1.5c. Off t.w. over 75,000 gals.: Ethyl 4c, Red Crown, 3.5c, Stanolind 2c.

Chicago reseller discounts: any quantity Ethyl 4c, "regular" 3.5c, third grade 2c, by principal marketers. Discounts are off s.s. below 75,000 gals., and off t.w. above 75,000 gals.

Consumer discounts, off t.w., outside Chicago: 500 to 75,000 gals., Ethyl 3c, Red Crown 2.5c, Stanolind 1.5c. Over 75,000 gals., Ethyl 4c, Red Crown 3.5c, Stanolind 2c.

Chicago consumer discounts, off t.w.: over 500 gals., Ethyl 4c, regular 3.5c, third grade 2c.

Dump discount to all t.w. buyers: effective Nov. 4, 1931, 25 gals. and over, all gasolines, 1c off t.w. price. No change in total discount to contract customers.

Discount to commercial consumers at service stations (company owned or controlled stations), beginning Oct. 1, 1932: 1c per gal. off s.s. price on Ethyl and Standard Red Crown gasolines, in any quantity.

S. O. NEBRASKA

Red Crown Gasoline

Omaha, Neb.	11.3	5	16.3	17.3	9
McCook, Neb.	12	5	17	17	8.5
Norfolk, Neb.	11.8	5	16.8	17.8	10.8
North Platte, Neb.	12	5	17	17	9
Scottsbluff, Neb.	12	5	17	17	9.5

Reliance Gasoline (Third Grade)

Omaha, Neb.	9.3	5	14.3	14.4	9
McCook, Neb.	7.9	5	12.9	12.9	8.5
Norfolk, Neb.	9	5	14	15	10.8
North Platte, Neb.	9.9	5	14.9	14.9	9
Scottsbluff, Neb.	10	5	15	15	9.5

Dealer discount: on gasoline off normal s.s. prices: Ethyl 3c; Red Crown 2.5c; Reliance 1c.

S. O. LOUISIANA

Standard Gasoline

	Posted Retail T.W.	Tax	Total Posted Retail T.W.	Posted Retail S.S.	Kerosine T.W.
Little Rock, Ark.	8.5	7	15.5	15.5	10
Alexandria, La.	7	*7	14	14	*8.5
Baton Rouge, La.	9	6	15	15	*10
New Orleans, La.	8.5	*7	15.5	15.5	*11
Lake Charles, La.	8	*7	15	15	*10
Shreveport, La.	8	6	14	14	*11
Lafayette, La.	8	*7	15	15	*10
Bristol, Tenn.	10	8	18	18	13
Chattanooga, Tenn.	11	8	19	19	11
Knoxville, Tenn.	11.5	8	19.5	19.5	12.5
Memphis, Tenn.	10	8	18	18	10
Nashville, Tenn.	11	8	19	19	10

Acto Gasoline (Third Grade)

	Tax	Total Posted Retail S.S.	Kerosine T.W.
Little Rock, Ark.	7	14	10
Alexandria, La.	*7	12	*8.5
Baton Rouge	6	14	*10
New Orleans, La.	*7	12.5	*11
Lafayette, La.	*7	14.5	*10
Lake Charles, La.	*7	13.5	*10
Shreveport, La.	6	11.5	*11
Bristol, Tenn.	8	15.5	13
Chattanooga, Tenn.	18	16	11
Knoxville, Tenn.	8	16.5	12.5
Memphis, Tenn.	8	17	10
Nashville, Tenn.	8	16	10

Open dealer discounts: on Standard gasoline, 2½c per gal. off posted retail t. w. price; 2c on kerosine; no discount on Blue-Gas. Commercial consumers get sliding scale of discounts.

To commercial consumers: on Standard gasoline, on t.w. deliveries, per year, off t.w. price: up to 75,000 gals., 2.5c; 75,000 to 149,999 gals., 3c; 150,000 to 299,999 gals., 3.5c; 300,000 gals. and over, 4c.

Lease and agency discounts: Esso gasoline, 2.5c; Standard gasoline, 2c; Blue-Gas, 1c off s.s. price, plus 1c per gal. rental.

***Lake Charles, Alexandria, New Orleans and Lafayette gasoline tax includes 5c state tax, 1c federal tax, and 1c parish tax. Louisiana kerosine prices include 1c state tax; New Orleans includes also 1c parish tax.**

MAGNOLIA PETROLEUM

	Mobilgas T.W.	Tax	Total T.W.	S.S.	Kerosine T.W.
Muskogee, Okla.	4.5	5	9.5	12	6
Oklahoma City	6.5	5	11.5	14	8
Tulsa, Okla.	7.5	5	12.5	15	8
Fort Smith, Ark.	8.5	†5	13.5	13.5	10
Little Rock, Ark.	8.5	7	15.5	15.5	10
Texarkana, Ark.	9	*5	14	14	11
Dallas, Tex.	7.5	5	12.5	15	7
El Paso, Tex.	7.5	5	12.5	15	10
Fort Worth, Tex.	7.5	5	12.5	15	7
Houston, Tex.	7.5	5	12.5	15	8
San Antonio, Tex.	8.5	5	13.5	16	8

Metro Gasoline (Third Grade)

Muskogee, Okla.	4	4	9	10	6
Oklahoma City	5	5	10	11	8
Tulsa, Okla.	6	5	11	12	8
Fort Smith, Ark.	7.5	†5	12.5	12.5	10
Little Rock, Ark.	7	7	14	14	10
Texarkana, Ark.	4	5	9	10	11
Dallas, Tex.	5	5	10	11	7
El Paso, Tex.	5	5	10	11	10
Fort Worth, Tex.	5	5	10	11	7
Houston, Tex.	6	5	11	12	8
San Antonio, Tex.	6	5	11	12	8

Dealer discounts: on Mobilgas 2.5c off t.w. price at Little Rock, Fort Smith and Texarkana. On Metro gasoline, 1c per gal. off t.w. price thru territory. Arkansas kerosine prices, 2c discount off t.w. price.

***In Texarkana, 4c Texas tax applies; outside Texarkana, 6c Arkansas tax applies.**

†In Fort Smith, 4c Oklahoma tax applies; outside Fort Smith, 6c Arkansas tax applies.

CONTINENTAL OIL

Conoco Gasoline

Denver, Col.	9	5	14	17	12.5
Pueblo, Col.	9	5	14	17	12.5
Grand Junc., Colo.	13	5	18	21	14.5
Casper, Wyo.	11	5	16	19	10
Cheyenne, Wyo.	9	5	14	17	11.5
Butte, Mont.	14	6	20	23	17
Helena, Mont.	15	6	21	24	17
Salt Lake City, Utah	11	5	16	19	16
Boise, Ida.	12.5	6	18.5	21.5	18
Twin Falls, Ida.	14.5	6	20.5	23.5	18
Albuquerque, N. M.	8	6	14	17	12

CONTINENTAL OIL (Cont'd)

Third Grade Gasoline

	T.W.	Tax	Total T.W.	S.S.	Kerosine T.W.
Denver, Col.	7	5	12	14	12.5
Cheyenne, Wyo.	8	5	13	15	11.5
Helena, Mont.	14	6	20	22	17
Salt Lake City, Utah	9	5	14	15	16
Boise, Ida.	11.5	6	17.5	18.5	18
Albuquerque, N. M.	*	6	*	14	12

*Not sold thru tank wagon.

S. O. CALIFORNIA

Standard Gasoline

San Francisco, Cal.	10	4	14	17	12.5
Los Angeles, Cal.	8.5	4	12.5	15.5	12.5
Fresno, Cal.	10	4	14	17	14
Phoenix, Ariz.	11	6	17	20	†16
Reno, Nev.	12.5	5	17.5	20.5	15.5
Portland, Ore.	8	5	13	16	13.5
Seattle, Wash.	8	6	14	17	13.5
Spokane, Wash.	10.9	6	16.9	19.9	18
Tacoma, Wash.	8	6	14	17	13.5

Flight Gasoline (Third Grade)

San Francisco, Cal.	8.5	4	12.5	13.5	12.5
Los Angeles, Cal.	6.9	4	10.9	11.9	12.5
Fresno, Cal.	8.5	4	12.5	13.5	14
Reno, Nev.	11	5	16	17	15.5
Phoenix, Ariz.	9	6	15	16	†16
Portland, Ore.	7	5	12	13	13.5
Seattle, Wash.	7	6	13	14	13.5
Tacoma, Wash.	7	6	13	14	13.5
Spokane, Wash.	9.9	6	15.9	16.9	18

†Includes 5c state tax.

Discounts: On all gasolines, to 100% dealers, off 1c t.w. price thru territory.

CANADA

Prices of Imperial Oil Ltd.

(Per Imperial Gallon, which is 1.2 U. S. Gallons)

Imperial Three Star Gasoline

Hamilton, Ont.	16.5	6	22.5	25.5	15.5
Toronto, Ont.	16.5	6	22.5	25.5	15.5
Brandon, Man.	22	7	29	32.5	20.5
Winnipeg, Man.	19	7	26	29.5	17.5
Regina, Sask.	23	6	29	33	21.5
Saskatoon, Sask.	25	6	31	35	23.5
Edmonton, Alta.	23.5	5	28.5	32.5	22.5
Calgary, Alta.	20	5	25	29	19
Vancouver, B. C.	19.5	7	26.5	29.5	22.5
Montreal, Que.	16	6	22	25	15
St. John, N. B.	17.5	7	24.5	28.5	20.5
Halifax, N. S.	17.5	6	23.5	27.5	20.5

Aviation Gasoline Prices

Following are tank wagon prices of aviation gasoline in principal marketing territories. Tax column includes 1c federal tax and state tax; also municipal taxes as indicated in footnotes.

S. O. NEW JERSEY

Prices in Effect April 3, 1933

Stanavo Aviation Gasoline

	T.W.	Tax	Total T.W.
Newark, N. J.	16	1	17
Baltimore, Md.	16	5	21
Washington, D. C.	16.3	3	19.3

Discounts: to dealers and contract consumers, 2c per gal. off posted t.w. price.

COLONIAL BEACON OIL CO.

Stanavo Aviation Gasoline

New York City	16	4	20
Boston, Mass.	17	4	21

S. O. PENNSYLVANIA

Stanavo Aviation Gasoline

Philadelphia, Pa.	12.5	4	16.5
Pittsburgh, Pa.	15	4	19
Altoona, Pa.	15	4	19
Harrisburg, Pa.	12.5	4	16.5

Discounts: to dealers and contract consumers, 2c per gal. off posted t.w. price.

S. O. OHIO

Sohio Aviation Gasoline

Thru Ohio	15	5	20

Discounts: to airports, 1 to 4c, based on quantity.

S. O. INDIANA

Stanavo Aviation Gasoline

	T.W.	Tax	Total T.W.
Chicago, Ill.	14.1	4	18.1
Indianapolis, Ind.	14.4	5	19.4
Detroit, Mich.	14.8	4	18.8
Milwaukee, Wisc.	14.3	5	19.3
Minneapolis, Minn.	15.4	4	19.4
St. Louis, Mo.	13.6	3	16.6
Kansas City, Mo.	14.1	*4	18.1
Fargo, N. D.	17.1	4	21.1
Huron, S. D.	15.5	5	20.5
Wichita, Kans.	13	4	17

*Includes 1c city tax.

S. O. LOUISIANA

Stanavo Aviation Gasoline

Little Rock, Ark.	18	7	25
New Orleans, La.	17	*7	24
Shreveport, La.	17	6	23
Chattanooga, Tenn.	20	8	28
Memphis, Tenn.	18	8	26

Dealer and commercial consumer discount: 2c off posted retail t.w.

*Includes 1c parish tax.

Magnolia Petroleum

Dallas, Tex.	10	5	15

CONTINENTAL OIL CO.

Conoco Aviation Gasoline

Denver, Colo.	12	5	17
Cheyenne, Wyo.	14	5	19
Helena, Mont.	18	6	24
Salt Lake City, Utah	14	5	19
Albuquerque, N.M.	13	6	19
Boise, Ida.	17.5	6	23.5

S. O. CALIFORNIA

Stanavo Aviation Gasoline

Phoenix, Ariz.	14	6	20
Los Angeles, Cal.	12.5	4	16.5
San Francisco, Cal.	14	4	18
Reno, Nev.	17	5	22
Portland, Ore.	10.4	5	15.4
Seattle, Wash.	10.4	6	16.4
Spokane, Wash.	13.9	6	19.9

Note: Above prices are in tank trucks or iron barrels. For deliveries direct into airplane fuel tanks, 3c per gal. additional.

Naphtha Prices

Prices in Effect April 3, 1933

	Oleum Spirits	V.M.&P. Naphtha	Cleaner Naphtha
Chicago	11.7	13.7	13
Detroit	15.4	16	16.5
Kansas City	†13	†14.5	†15.3
Milwaukee	*17.5	*19	*19.8
Minneapolis	**17.8	**19.3	**20.1
St. Louis	12.7	14.2	15
New York	...	12	15
Boston	...	16	16
Philadelphia	...	15	....

*Includes 4c state tax. †Includes 1c city tax.
**Includes 3c state tax.

Petroleum Spirits (Solvent)

Tank Cars (F.o.b. refinery or seaboard terminal)	
New York Harbor	8.50
Philadelphia district	8.50
Providence	8.50
Tank Wagon or Steel Barrels	
New York City	12
Syracuse	15
Rochester	14
Buffalo (net price)	13
Providence	16
Boston	16
Bridgeport	16
Newark	12
Philadelphia	12
Lancaster	17
Altoona	17
Baltimore	*14

Note: 2c off above t.w. prices to large buyers in some instances. *4c discount allowed on 200 gal. or more in Baltimore only, with 1c premium for steel barrels.

(Continued on Page 77)

SAVE MONEY

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+
"WILGO"
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Jenkins Bros.

Promotes Speed at loading rack

Jenkins Valves for loading racks are built for speed and hard work. They eliminate liquid hammer and shock; protect meters and pumps; prevent leaks and waste. Have yoke and lever adjustable to any position; are easy to operate—quick opening, self-closing. Write for bulletin 153.

JENKINS BROS.
80 White St., New York, N. Y., Bridgeport, Conn., Boston, Mass., Chicago, Ill., Philadelphia, Pa.

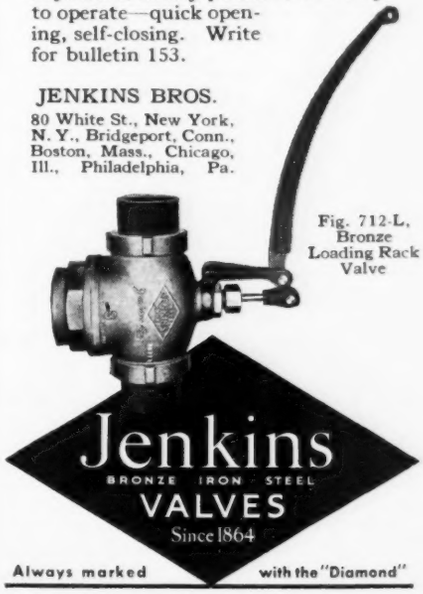
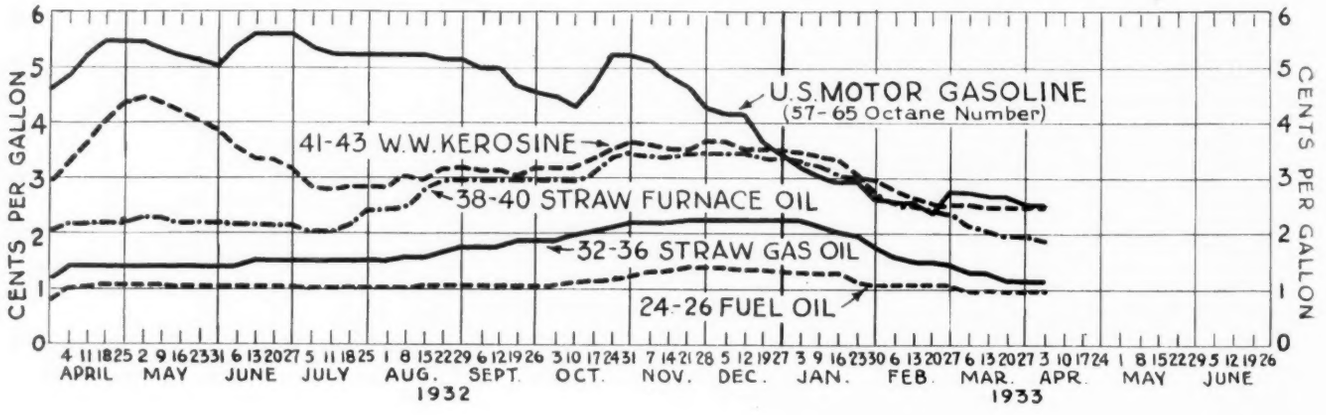


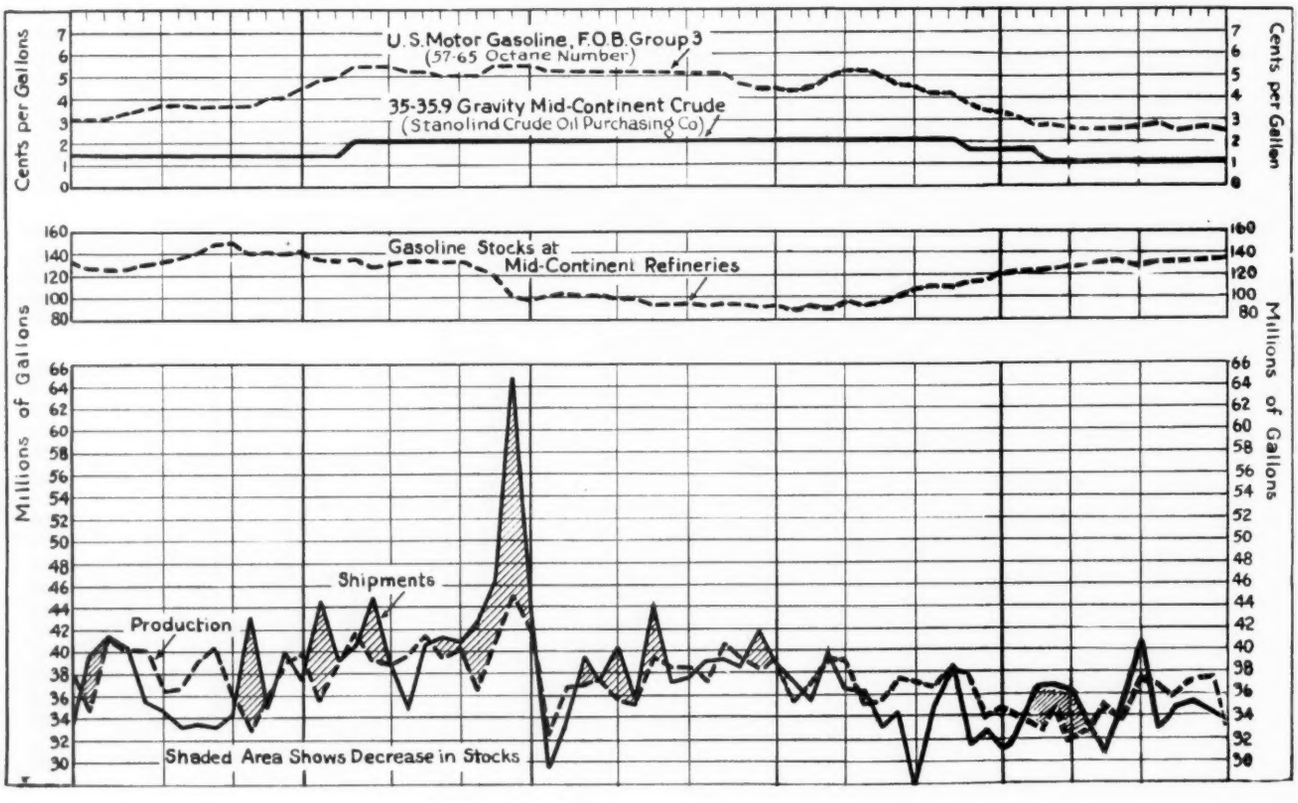
Fig. 712-L, Bronze Loading Rack Valve

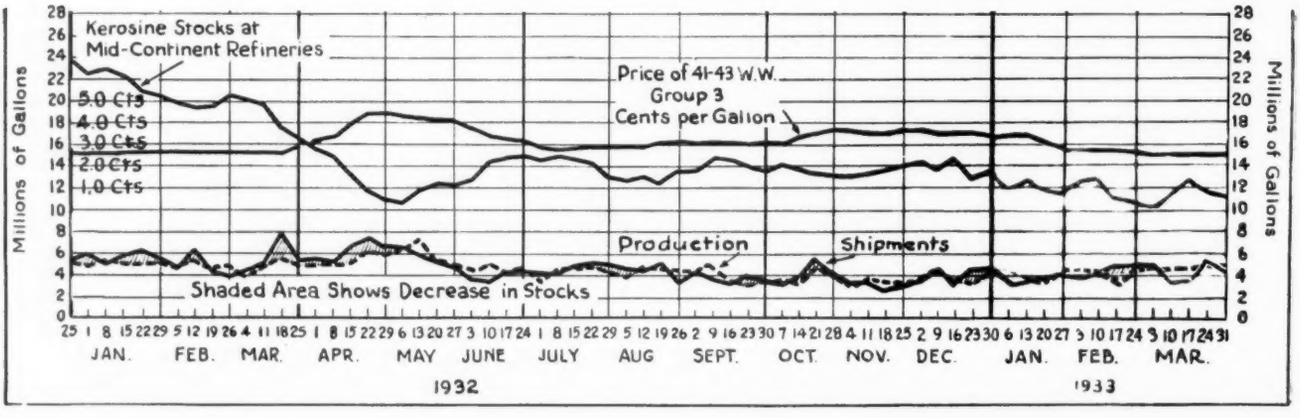
Always marked with the "Diamond"

Barometer of Mid-Continent Refinery Market—Week Ending Mar. 31

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, from Reports Made by 76 Plants to National Petroleum News


CENTS PER GALLON
U.S. MOTOR GASOLINE
(57-65 Octane Number)
41-43 W.W. KEROSINE
38-40 STRAW FURNACE OIL
32-36 STRAW GAS OIL
24-26 FUEL OIL
APRIL MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUNE
1932
1933





Compilation Of Mid-Continent Refinery Operations

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Mid-Continent Refinery Operations, Week Ended March 31 (By Teletype)

	Kansas	Oklahoma	North & Cent. Texas	West Texas	North La.-Ark.	Total Week Ended March 31
Plants Operating.....	10	23	23	10	10	76
Da. Av. Cap. Bbls....	94,000	162,500	107,400	71,500	60,700	496,100
Da. Cracking Capacity	53,200	64,600	23,100	26,250	31,700	198,850
Da. Av. Crude Runs..	44,738 — 24.3	77,506 — 3.0	37,932 — 3.0	13,927 — 6.3	28,830 — 8.2	202,933 — 11.1
Da. Av. Other Oil....	6,646 — 26.2	1,516 +1431.3	579 —174.6	69	17,296 + 0.2	26,106 — 8.3
GASOLINE—Gallons						
Stocks, March 24....	39,080,000	53,508,000	29,808,000	5,964,000	8,358,000	136,718,000
Prod. 3-24 to 3-31....	7,739,000 — 24.9	12,202,000 — 10.8	6,039,000 — 4.1	1,843,000 + 8.1	4,543,000 — 15.3	32,366,000 —13.4
Ship. 3-24 to 3-31....	8,322,000 + 6.1	14,763,000 + 22.5	4,959,000 — 39.3	1,250,000 + 2.4	4,359,000 — 15.3	33,653,000 — 2.3
Stocks, March 31....	38,497,000 — 1.5	50,947,000 — 4.8	30,888,000 + 3.6	6,557,000 + 9.9	8,542,000 + 2.2	135,431,000 — 0.9
Ratio Sales to Prod...	107.5%	121.0%	82.1%	67.8%	95.9%	104.0%
KEROSINE—Gallons						
Stocks, March 24....	6,162,000	4,178,000	784,000	.....	781,000	11,905,000
Prod. 3-24 to 3-31....	1,765,000 — 22.5	1,578,000 — 2.9	400,000 — 13.2	....	277,000 — 50.5	4,020,000 — 18.3
Ship. 3-24 to 3-31....	1,683,000 — 35.3	2,085,000 + 19.6	590,000 + 19.0	....	545,000 — 0.5	4,903,000 — 9.0
Stocks, March 31.....	6,244,000 + 1.3	3,671,000 — 12.1	594,000 — 24.2	....	513,000 — 34.3	11,022,000 — 7.4
Ratio Sales to Prod...	95.4%	132.1%	147.5%	.....	196.8%	122.0%
FURNACE OIL—Gallons						
Stocks, March 24....	1,248,000	2,756,000	97,000	.....	115,000	4,216,000
Prod. 3-24 to 3-31....	181,000 — 76.6	685,000 — 11.8	15,000 — 40.0	....	225,000 + 14.7	1,106,000 — 37.5
Ship. 3-24 to 3-31....	599,000 + 21.7	939,000 + 6.1	11,000 +175.0	....	243,000 + 23.3	1,792,000 + 13.6
Stocks, March 31....	830,000 — 33.5	2,502,000 — 9.2	101,000 + 4.1	....	97,000 — 15.7	3,530,000 — 16.3
Ratio Sales to Prod...	330.9%	137.1%	73.3%	.....	108.0%	162.0%
GAS OIL—Gallons						
Stocks, March 24....	3,328,000	20,655,000	6,868,000	575,000	4,365,000	35,791,000
Prod. 3-24 to 3-31....	—72,000	1,638,000 + 2.1	382,000 — 59.6	254,000 + 17.1	1,989,000 — 4.1	4,191,000 — 28.3
Ship. 3-24 to 3-31....	91,000 — 83.3	1,231,000 + 18.8	37,000 — 92.9	544,000 + 38.8	2,227,000 — 3.6	4,130,000 — 29.5
Stocks, March 31....	3,165,000 — 4.9	21,062,000 + 2.0	7,213,000 + 5.0	285,000 — 50.4	4,127,000 — 5.5	35,852,000 + 0.2
Ratio Sales to Prod...	.....	75.2%	9.7%	214.2%	112.0%	98.5%
FUEL OIL—Gallons						
Stocks, March 24....	10,514,000	48,700,000	59,165,000	10,152,000	15,131,000	143,662,000
Prod. 3-24 to 3-31....	3,719,000 + 3.7	5,425,000 + 6.6	3,268,000 + 13.1	2,140,000 — 9.5	3,368,000 — 6.5	17,920,000 + 2.3
Ship. 3-24 to 3-31....	3,680,000 + 17.1	5,157,000 + 2.2	728,000 — 90.3	2,758,000 + 45.2	3,181,000 + 16.1	15,504,000 —22.0
Stocks, March 31....	10,553,000 + 0.4	48,968,000 + 0.6	61,705,000 + 4.3	9,534,000 — 6.1	15,318,000 + 1.2	146,078,000 + 1.7
Ratio Sales to Prod...	99.0%	95.1%	22.3%	128.9%	94.4%	86.5%

Gasoline Produced by Various Methods, Week Ended March 31

	Kansas	% of Total	Oklahoma	% of Total	North & Cent. Texas	% of Total	West Texas	% of Total	Louisiana-Arkansas	% of Total	Total	% of Total
Straight Run.....	3,905,000	50.5	6,472,000	53.0	2,805,000	46.4	1,219,000	66.1	1,862,000	41.0	16,263,000	50.2
Cracked.....	3,070,000	39.7	4,215,000	34.5	2,732,000	45.2	455,000	24.7	2,510,000	55.2	12,982,000	40.1
Natural.....	764,000	9.8	1,515,000	12.5	502,000	8.4	169,000	9.2	171,000	3.8	3,121,000	9.7
Total.....	7,739,000		12,202,000		6,039,000		1,843,000		4,543,000		32,366,000	

+ or — columns are % change over previous week.

Gasoline Stocks Cut in Mid-Continent as Output Falls

Staff Special—By Teletype
TULSA, April 3

CRUDE oil runs at 76 Mid-Continent refineries were cut 25,700 barrels daily average the week ended March 31. Charges of other oils were reduced 2300 barrels daily average.

Gasoline production was 5,000,000 gallons less than in the preceding week. All districts except West Texas had less output. Gasoline shipments were larger from all districts except Louisiana-Arkansas and North and Central Texas. Decline in those two districts was ample to cause 800,000-gallon decline in the area. However, stocks were cut 1,200,000 gallons, due to reductions in Kansas and Oklahoma.

Kerosine shipments were off 400,000 gallons. With production off 900,000 gallons stocks were lowered about 900,000 gallons.

Furnace stocks were cut 500,000 gallons when output was reduced and shipments rose. Gas and fuel oil stocks increased slightly.

Summary for the Month

Production and shipments, all reporting refineries, for four weeks ended March 31. Change in stocks figured from March 3.

GASOLINE

	Gallons
Production	142,012,000
Shipments	137,434,000
Net change in stocks	+4,578,000
Ratio sales to production	96.8%

KEROSINE

Production	17,760,000
Shipments	17,262,000
Net change in stocks	+498,000
Ratio sales to production	97.2%

FURNACE OIL

Production	4,950,000
Shipments	5,990,000
Net change in stocks	—1,040,000
Ratio sales to production	121.0%

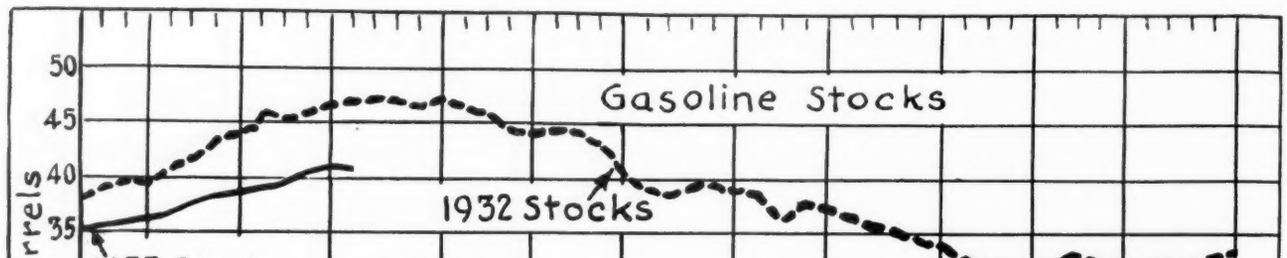
GAS OIL

Production	20,559,000
Shipments	16,858,000
Net change in stocks	+3,701,000
Ratio sales to production	82.0%

FUEL OIL

Production	66,087,000
Shipments	66,775,000
Net change in stocks	—688,000
Ratio sales to production	101.0%

U. S. Crude Runs and Gasoline Stocks as Reported Weekly by A. P. I.



Bulk Stocks of Motor Fuel Increase 357,000 Barrels

By Telegraph

NEW YORK, April 4.

BULK stocks of motor fuel rose 357,000 barrels in the week ended April 1 as refiners continued to increase their crude runs to stills. Total bulk stocks of refiners reporting to the American Petroleum Institute stood at 59,104,000 barrels on April 1. In the past four weeks bulk motor fuel stocks have risen 2,779,000 barrels, stocks having totaled 56,325,000 barrels on March 4.

Refinery gasoline stocks fell 51,000 barrels during the week to 40,668,000 barrels. Bulk terminal stocks dropped 147,000 barrels to 12,319,000 barrels but stocks in transit to terminals increased 505,000 barrels to 1,517,000 barrels.

Six refining districts drew on gasoline storage during the week led by Texas Gulf refiners with a cut in inventories of 325,000 barrels. Louisiana Gulf refiners drew 50,000 barrels from storage, Rocky Mountain refiners 38,000 barrels, Inland Texas refiners 63,000 barrels, Okahoma-Kansas refiners 17,000 barrels and Appalachian refiners 22,000 barrels.

Indiana-Illinois added 325,000 barrels of gasoline to storage during the week. In California refinery gasoline storage rose 102,000 barrels as refiners continued to build up their crude runs. Average runs during the week just closed were 440,000 barrels daily, an increase of 67,000 barrels over the previous week and 167,000 barrels daily over runs in the week following the earthquake.

Fuel and gas oil stocks increased 818,000 barrels in the week ended April 1, standing at 123,823,000 barrels on that date.

Current Refinery Operations

Districts	Per Cent Capacity Reporting	Daily Average Crude to Stills (Barrels) Week Ended		Per Cent of Reporting Capacity Operated Week Ended		Stocks (Thousands of Barrels) Gasoline		Gas & Fuel Oil		% Cracked of Total Capacity Reporting	Gasoline Production Daily Av. Production (Barrels) Week Ended	
		Apr. 1	Mar. 25	Apr. 1	Mar. 25	Apr. 1	Mar. 25	Apr. 1	Mar. 25		Apr. 1	Mar. 25
East Coast	99.1	466,000	472,000	73.0	73.9	5,994	5,957	6,058	6,200	94.8	86,000	85,000
Appalachian	95.0	71,000	83,000	52.6	61.5	1,452	1,474	851	820	97.5	19,000	21,000
Ind., Ill., Ky.	97.5	313,000	298,000	73.8	70.3	6,235	5,923	3,438	3,394	96.1	93,000	86,000
Okla., Kans., Mo.	84.9	204,000	218,000	52.3	55.9	3,826	3,843	3,037	2,911	92.5	47,000	52,000
Inland Texas	56.4	74,000	84,000	41.6	47.3	1,359	1,422	2,163	2,058	81.1	19,000	19,000
Texas Gulf	97.7	396,000	382,000	73.1	70.5	6,040	6,365	6,288	5,861	97.8	73,000	74,000
La. Gulf	97.3	101,000	114,000	71.1	80.3	1,614	1,664	2,198	2,055	100.0	22,000	22,000
No. La., Ark.	88.5	32,000	36,000	40.5	45.6	210	197	646	644	86.4	9,000	9,000
Rocky Mt.	90.8	24,000	25,000	17.4	18.1	1,501	1,539	620	623	95.4	7,000	8,000
California	94.6	440,000	373,000	50.8	43.1	12,437	12,335	98,524	98,439	100.0	28,000	25,000
Total	91.6	2,121,000	2,085,000	60.0	59.0	40,668	40,719	123,823	123,005	95.4	403,000	401,000

Refiners' & Compounders' Supplies

Following are average market prices for materials used by refiners and compounders effective on the date shown.

Refiners' Supplies

	April 3	March 27
Soda Ash Light 58⅓ bags, cwt.	$1.125-1.38	$1.125-1.38
Silicate of Soda 60 deg. drums ....cwt.	$1.75-1.90	$1.75-1.90
Silicate of Soda 40 deg. drums ....cwt.	$0.70-1.00	$0.70-1.00
Sal Soda wks.....	$0.90-1.00	$0.90-1.00
Caustic Soda 76% solid..cwt.	$2.55	$2.55
Sulfuric Acid 60 deg. tank cars, f.o.b. shipping point per ton.....	$11.00-12.50	$11.00-12.50
Sulfur, flowers of.....cwt.	$3.10-4.05	$3.10-4.05
Liquid Chlorine, tank cars, wks.....lb.	1.75	1.75

Compounder's Supplies

Vegetable Oils

Linseed carloads, spot.....lb.	7.60	7.60
Tanks, spot.....	7.00	7.00
Soya Bean, Tank, coast...lb.	3.25–3.50	3.25–3.50

Oleic Acid

Distilled, tanks.....lb.	5.00	5.00
Distilled, bbls.....lb.	5.875	5.875
Saponified, tanks.....lb.	5.25	5.25
Saponified, bbls.....lb.	6.00	6.00

Lard Oils

Prime Winter Strained....lb.	8.50	8.50
Extra Winter Strained....lb.	7.50	7.50
Extra No. 1.....lb.	6.625	6.625
No. 1.....lb.	6.00	6.00
No. 2.....lb.	5.75	5.75
Tallow oil.....lb.	6.00	6.00

Neatsfoot Oil

Pure, bbls.....lb.	8.00	8.00
Extra, bbls.....lb.	7.00	7.00
No. 1 bbls.....lb.	6.75	6.75
Cold Pressed.....lb.	12.50	12.50

Fish Oils

Menhaden Oil		
Light Pressed.....gal.	*31–32	*31–32
Light Pressed, tank cars, N. Y.....gal.	*23.50-24	*23.50-24
Yellow bleached.....gal.	34.50-35	34.50-35
Whale, extra winter bleached, ...gal.	60.00	60.00

Naval Stores

Steam distilled turpentine, N. Y.....gal.	42.00	42.00
Steam, distilled turpentine, Savannah.....gal.	39.00	39.00
Gum turpentine, N. Y...gal.	47.75	49.00
Gum turpentine, f.o.b. cars Savannah.....gal.	37.75	38
Wood Rosin, N. Y.....bbl.	$3.58	$3.50
Wood Rosin F, Savn'h...bbl.	$2.65	$2.70
Gum Rosin B, N. Y.....bbl.	$3.15	$3.00
Gum Rosin B, f.o.b. cars Savannah.....bbl.	$1.90	$1.75
Rosin oil, pure.....gal.	39–40	39–40
Rosin oil, compounded...gal.	41–43	41–43

Pine Tar

Kiln burnt.....	$8.00-9.00	$8.00- 9.00
Retort.....bbl.	$9.50–10.00	$9.50-10.00

Alcohol

Denatured Formula 5, per gal., in bbls., car lots.....	39.6	39.6

*Nominal.

SKILLED SUPERVISION

Guarantees the Quality of Gulf Products

COASTAL AND PARAFFINE CRUDES
GASOLINE—LUBRICATING OILS
NAPHTHA—GAS—OILS
WAX—PETROLEUM COKE
CYLINDER—ENGINE—CORDAGE

Gulf Refining Company
General Sales Offices:
PITTSBURGH, PA.

District Sales Offices: New York, Boston, Philadelphia, Louisville, Atlanta, Houston, New Orleans

1909 *1933*

"24 YEARS OLD"

Still going strong.
Still saving money for the oil trade.
Still able to save money for you.

437 Chestnut St.
PHILADELPHIA

National
PETROLEUM MUTUAL
Fire Insurance Company

Crude Oil Prices (in Effect April, 3, 1933)

Crude prices for the whole year in OIL PRICE HANDBOOK published annually

(Prices are per barrel at the well; A. P. I. gravity)

EASTERN FIELDS

(Posted by Joseph Seep Purchasing Agency)

Penna. Grade Oil in Southwest Penna. Pipe Lines.....$1.17
(Effective Jan. 21, 1933)

Penna. Grade Oil in Eureka Pipe Lines (West Virginia)..... 1.12
(Effective Jan. 21, 1933)

Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O.).....†0.97
(Effective Jan. 21, 1933)

Corning Oil in Buckeye Pipe Lines (Ohio)..$0.70
(Effective Jan. 20, 1933)

†For Macksburg oil run previous to March 1, 1932, $0.92.

Posted by Other Companies

Tide Water Pipe Co., Ltd.:
Bradford-Alleghany district (Penna. and N. Y.).....$1.47
(Effective Jan. 21, 1933)

*The Pennzoil Co.:
Penna. Grade Oil in National Transit Lines *$1.42
(Effective Jan. 21, 1933)

Ashland Refining Co.:
Somerset Oil in Ashland Lines (Kentucky)..$0.45
(Effective Jan. 21, 1933)

*The Pennzoil Co. posts $1.42 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields; prices in other districts range down to $1.37 per bbl. at wells.

MICHIGAN

(Posted by Pure Oil Co.)

Midland, Midland County (Dec. 31, 1932)..$0.95

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

Effective Jan. 18, 1933

Wooster	$0.70	Princeton	$0.62
Lima	0.70	Illinois	0.62
Indiana	0.42	West Kentucky	0.57

CANADIAN CRUDE

Posted by Imperial Oil Refineries, Ltd.

Western Ontario

(Effective Jan. 18, 1933)

Petrolia	$1.75
Oil Springs	$1.82

Alberta

Turner Valley

(Effective Jan. 24, 1933)

40-44.9	$1.41	Naphtha:	
45-49.9	1.90	†Clear	$2.82
50 and above	2.41	†Discolored	2.58

†Clear naphtha: 22 color; 10 lbs. vapor pressure, 90% recovery, end point, 410° A.P.I. Discolored naphtha: 90% recovery and 10 lbs. vapor pressure.

(Effective Jan. 23, 1933)

Red Coulee.....$0.75

OKLAHOMA, KANSAS and NORTH TEXAS

Prices of Stanolind Crude Oil Purchasing Co.

(In Oklahoma, Kansas, North and North Central Texas)

(Effective Jan. 18, 1933)

Below 29	$0.28	35-35.9	$0.42
29-29.9	.30	36-36.9	.44
30-30.9	.32	37-37.9	.46
31-31.9	.34	38-38.9	.48
32-32.9	.36	39-39.9	.50
33-33.9	.38	40 and above	.52
34-34.9	.40		

Above prices as posted by Stanolind were met by the following companies on the dates mentioned:

Jan. 20, by Humble in North Texas, Ranger, Mexia, Powell, Boggy Creek, Richland, Wortham, Currie and Moran, Tex.; Gypsy and Carter Oil in Oklahoma and Kansas; and Pure Oil in Oklahoma, except that Pure's schedule begins with below 28 at $0.20.

Jan. 19, by The Texas Co. in Oklahoma, North, and North Central Texas; Shell Petroleum in Oklahoma and Kansas.

Jan. 18, by Continental Oil in Oklahoma, Kansas and North Texas; by Sinclair-Prairie, Deep Rock, Bell Oil & Gas and Barnsdall Oil Corp.

Magnolia Petroleum Co.

(In Oklahoma, North, North Central and Central Texas)

(Including in North and North Central Texas: Burkburnett, Archer, Stephens, Henrietta, Electra, Comanche and Olden; in Central Texas: Mexia, Wortham, Corsicana Light and Panola county).

(Effective Jan. 20, 1933)

Below 25	$0.20	27-27.9	$0.26
25-25.9	.22	28-28.9	.28
26-26.9	.24		

Rest of schedule same as Stanolind, which see.

Lytton Springs, Tex	$0.45
Corsicana heavy	.30

PANHANDLE TEXAS

Humble Oil & Refining Co.

(Effective Feb. 28, 1933)

Carson Hutchinson Counties

Below 36	$0.20	38-38.9	$0.26
36-36.9	.22	39-39.9	.28
37-37.9	.24	40 and above	.30

Gray County

Below 36	$0.30	38-38.9	$0.36
36-36.9	.32	39-39.9	.38
37-37.9	.34	40 and above	.40

Feb. 28, Continental Oil met Humble in Carson and Hutchinson; March 7, Magnolia met; March 6, The Texas Co. met Humble in the Panhandle, except that its minimum grade is 35-35.9.

EAST TEXAS

Humble, Magnolia, Texas Co. and Sinclair $0.50

Effective Jan. 18, by Sinclair; Jan. 19, The Texas Co.; Jan. 20, Magnolia, Humble and Shell.

WEST TEXAS

Humble Oil & Refining Co.

(Effective Feb. 28, 1933)

Jones and Fisher counties.....$0.30

(Effective Jan. 20, 1933)

Pecos, Winkler, Crane, Upton, Crockett, Ector, Howard and Glasscock Counties.....$0.30

Jan. 19, posted by The Texas Co., and Jan. 20 met by Magnolia.

Jan. 20, met by Shell in Howard-Glasscock, Winkler, Upton, Crane and Pecos (excepting Yates shallow pool). For Yates shallow pool in Pecos county, $0.20.

NEW MEXICO

(Effective Jan. 20, 1933)

Lea County (Humble, Shell and *The Texas Co.) $0.30.

*The Texas Co., Jan. 19.

Posted by Continental Oil Co.

(Effective Dec. 15, 1932)

Artesia (Eddy County)	$0.50
Jackson (Grant County) and Maljamar	$0.45
Cat Creek, Mont. (Effective Dec. 16)	$0.87

SOUTH and SOUTHWEST TEXAS

(Posted by Humble Oil & Refining Co.)

(Effective Jan. 20, 1933)

Darst Creek	$0.40	Salt Flat	$0.40
Mirando	.35	Pettus, Bee Co.	.55

Jan. 19, The Texas Co. posts $0.35 for Darst Creek. March 1, The Texas Co. made initial posting for Saxet, at $0.45; and Duval county, $0.35 per bbl.

Jan. 20, Magnolia posts $0.35 for Darst Creek and Mirando; and $0.30 for Luling

Jan. 20, Shell posted $0.40 for Salt Flat.

Conroe (Montgomery County)

Humble Oil & Refining Co.

(Effective Jan. 20, 1933)

35-35.9	$0.54	38-38.9	$0.60
36-36.9	.56	39-39.9	.62
37-37.9	.58	40 and above	.64

March 6, The Texas Co. posted for Conroe: 35-35.9, $0.59, plus 1c differential to top grade of 40 and above at $0.64.

CALIFORNIA CRUDE

Standard Oil Co. of California

(All gravities above those quoted take highest price offered in the field)

Effective March 5, 1933

Gravity	Signal Hill	Seal Beach Alamitos Heights	Huntington Beach	Inglewood	Playa Del Rey	Olinda-Brea Canon	Athens-Rosecrans Dominguez	Elwood Terrace	Torrance	Richfield	Whittier La Habra	Montebello	Coyote Hills	Santa Fe Springs	Newhall McKittrick Kern River	Midway Sunset Elk Hills Buena Vista Hills	Lost Hills	Coalinga	Wheeler Ridge	Ventura Avenue (Associated Oil Co.)	Santa Paula (Union Oil Co.)	Orcutt (Union Oil Co.)
14-14.9	$0.55	$0.55	$0.55	$0.55	$0.55	$0.55	....	....	$0.55	$0.55	$0.55	$0.55	$0.55	....	$0.49	$0.49	$0.49	$0.49	$0.49	....	$0.55	....
15-15.9	.55	.55	.55	.55	.55	.55	....	....	.55	.55	.55	.55	.55	....	.49	.49	.49	.49	.49	....	.55	....
16-16.9	.55	.55	.55	.55	.55	.55	....	....	.55	.55	.55	.55	.55	....	.49	.49	.49	.49	.49	....	.55	$0.49
17-17.9	.55	.55	.58	.58	.58	.58	....	....	.57	.56	.57	.55	.55	....	.49	.49	.50	.49	.49	....	.55	.49
18-18.9	.57	.55	.61	.61	.60	.61	....	....	.59	.58	.59	.55	.57	....	.49	.49	.52	.49	.49	....	.55	.49
19-19.9	.59	.57	.63	.64	.62	.64	....	....	.61	.61	.61	.55	.59	....	.49	.49	.54	.49	.49	....	.55	.49
20-20.9	.61	.59	.64	.67	.64	.66	....	....	.62	.63	.63	.55	.61	....	....	.52	.56	.49	.49	....	.56	.52
21-21.9	.63	.62	.66	.69	.66	.68	....	....	.64	.66	.65	.55	.63	$0.57	....	.55	.58	.51	.50	....	.57	.55
22-22.9	.65	.64	.68	.71	.69	.70	....	....	.66	.68	.67	.57	.65	.59	....	.57	.60	.53	.52	$0.58	.58	.57
23-23.9	.67	.67	.70	.73	.71	.72	....	....	.68	.70	.69	.60	.67	.62	....	.60	.62	.55	.54	.60	.59	.60
24-24.9	.69	.69	.72	.75	.73	.73	$0.65	....	.70	.73	.71	.62	.69	.64	....	.63	.63	.57	.56	.62	.60	.63
25-25.9	.71	.72	.74	....	.75	.75	.68	....	.72	.75	....	.65	.71	.66	....	.66	.65	.59	.58	.64	.61	.66
26-26.9	.73	.74	.75	....	.77	.77	.70	....	.73	.77	....	.68	.72	.69	....	.68	.67	....	....	.66	.63	.68
27-27.9	.75	.76	.77	....	.79	.73	....	....	....	.80	....	....	.74	.71	....	.71	.69	....	....	.68	.65	....
28-28.9	.77	.79	.79	....	.81	.75	....	....	....	.82	....	....	.76	.73	....	.74	.71	....	....	.70	.67	....
29-29.9	.79	.81	.81	....	....	.78	....	....	....	.84	....	....	.78	.76	....	.76	.73	....	....	.72	.69	....
30-30.9	.81	.84	.83	....	....	.81	....	....					.80	.78	....	.79	.75	....	....	.74	.71	....
31-31.9	....	....	....	....	....	.83	....	....					.82	.80	....	.82	....	....	....	....	....	....
32-32.9	....	....	....	....	....	.86	....	....			Kettleman Hills		.84	.83	....	.85	....	....	....	....	....	....
33-33.9	....	....	....	....	....	....	....	$0.83	....	....	$0.66	....	.86	.85	....	.87	....	....	....	....	....	....
34-34.9	....	....	....	....	....	....	....	.85	....	....	.68	....	.88	.87	....	....	....	....	....	....	....	....
35-35.9	....	....	....	....	....	....	....	.87	....	....	.70	....	....	.90	....	....	....	....	....	....	....	....
36-36.9	....	....	....	....	....	....	....	.89	....	....	.72	....	....	.92	....	....	....	....	....	....	....	....
37-37.9	....	....	....	....	....	....	....	.91	....	....	.74	....	....	.94	....	....	....	....	....	....	....	....
38-38.9	....	....	....	....	....	....	....	....	....	....	.76	....	....	.96	....	....	....	....	....	....	....	....
39-39.9	....	....	....	....	....	....	....	....	....	....	.78	....	....	....	....	....	....	....	....	....	....	....

Subject to Field Gathering Charge of 5c per Bbl.

F. O. B. Ship.

NORTH LOUISIANA-ARKANSAS
Prices of Standard Oil Co. of Louisiana
(Effective Jan. 20, 1933)

	Caddo	Homer	Haynesville	Sabine De Soto El Dorado	Sarepta Carterville
Below 29.	$0.20	$0.28	$0.19	$0.25	$0.17
29-29.9..	.22	.30	.21	.27	.19
30-30.9..	.24	.32	.23	.29	.21
31-31.9..	.26	.34	.25	.31	.23
32-32.9..	.28	.36	.27	.33	.25
33-33.9..	.30	.38	.29	.35	.27
34-34.9..	.32	.40	.31	.37	.29
35-35.9..	.34	.42	.33	.39	.31
36-36.9..	.36	.44	.35	.41	.33
37-37.9..	.38	.46	.37	.43	.35
38-38.9..	.40	.48	.39	.45	.37
39-39.9..	.42	.50	.41	.47	.39
40 and above	.44	.52	.43	.49	.41

Smackover (Jan. 20, 1933).....$0.20

Urania, La. (La. Oil Refg. Corp., Jan. 20, 1933) $0.25

Jan. 19, 1933, The Texas Co. cut N. Louisiana crude to: below 29, $0.28, plus 2c differential, to 40 and above at $0.52, all fields where it purchases. Texas Co. posted $0.30 for Smackover Jan. 19.

Jan. 20, 1933, Magnolia Petroleum posted in Pine Island, Haynesville, Bull Bayou, Cotton Valley, La., and Eldorado light and Rainbow, Ark.: below 29, $0.20; plus 2c differential to 40 and above at $0.44. Same date it posted $0.20 for Smackover, Ark. and El Dorado East field.

Jan. 20, Shell Petroleum posted in Black Bayou and White Castle, La.: Below 20, $0.32, plus 2c differential, to 34 and above, at $0.62; in Iowa district, La.: below 20, $0.22, plus 2c differential, to 34 and above, at $0.52.

Jan. 20, Louisiana Oil Refining Corp. posted in Caddo, Homer, Haynesville and Cotton Valley same prices as Texas Co., which see in paragraph above. Smackover, $0.25.

Jan. 20, Gulf Refining Co. of Louisiana posted below 25 at $0.20, plus 2c differential, to top grade of 40 and above at $0.52. Smackover, $0.30.

***GULF COASTAL**
Posted by Humble Oil & Refining Co.
(Effective Jan. 20, 1933)

Below 20.....	$0.32	27-27.9.....	$0.48
20-20.9.....	.34	28-28.9.....	.50
21-21.9.....	.36	29-29.9.....	.52
22-22.9.....	.38	30-30.9.....	.54
23-23.9.....	.40	31-31.9.....	.56
24-24.9.....	.42	32-32.9.....	.58
25-25.9.....	.44	33-33.9.....	.60
26-26.9.....	.46	34 and above...	.62
Refugio heavy.....			$0.45

*Includes these fields: Barbers Hill, Goose Creek, Hull, Humble, Liberty, Moss, Bluff, Mykawa, Orange, Pierce Junction, Rabbs Ridge, Raccoon Bend, Refugio light, Sour Lake, Spindletop, Sugarland and West Columbia.

Posted by The Texas Co.
(Effective March 6, 1933)

Below 22.....	$0.45	31-31.9.....	$0.55
22-22.9.....	.46	32-32.9.....	.56
23-23.9.....	.47	33-33.9.....	.57
24-24.9.....	.48	34-34.9.....	.58
25-25.9.....	.49	35-35.9.....	.59
26-26.9.....	.50	36-36.9.....	.60
27-27.9.....	.51	37-37.9.....	.61
28-28.9.....	.52	38-38.9.....	.62
29-29.9.....	.53	39-39.9.....	.63
30-30.9.....	.54	40 and above...	.64

ROCKY MOUNTAIN FIELDS
(Posted by Stanolind Oil & Gas Co.)
(Effective Jan. 18, 1933)

Salt Creek, Wyo.:

Below 29°.....	$0.28	35-35.9.....	$0.42
29-29.9.....	.30	36-36.9.....	.44
30-30.9.....	.32	37-37.9.....	.46
31-31.9.....	.34	38-38.9.....	.48
32-32.9.....	.36	39-39.9.....	.50
33-33.9.....	.38	40 and above...	.52
34-34.9.....	.40		

(Stanolind Oil & Gas Co.)

Hogback, N. Mex. (Effective Jan. 18, 1933)..$0.65

(Posted by Ohio Oil Co.)
(Effective Dec. 16, 1932)

Elk Basin, Wyo.....$0.87
Grass Creek Light..... .87
Lance Creek..... .92
(Effective Jan. 24, 1933)
Rock Creek..... .46
Big Muddy..... .50
(Effective Nov. 7, 1932)
Sunburst, Mont.....$0.75

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Costs No More Than Regular Gasoline

EN-AR-CO MOTOR OIL

Paraffine Base *Wear Proof*

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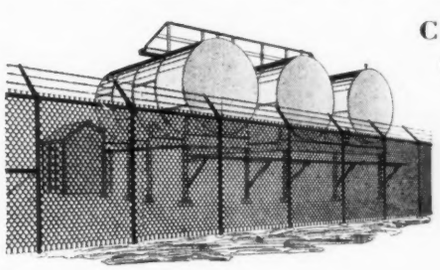
When thieves break into your plant, nine chances out of ten are, they'll wait until after you've gone home. You can't afford to have them steal your funds, materials or tools. You can't be on the job every hour of the day and night.

But, you *can* afford a Cyclone Fence which will protect your property from theft even after you've gone home. A Cyclone Fence, by preventing just one robbery, will more than pay for itself, and the entire cost is usually less than a watchman's salary for one year. Cyclone Fence is made of durable copper-steel by a company with 46 years of fence manufacturing and erecting experience.

Stop worrying about the probability of loss from theft. Write and let us give you the details. It's your job to protect your income producing facilities. It's our job to offer you adequate and economical protection.



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REG. U.S. PAT. OFF.

New Refining Patents

Desulfurizing Gasoline. U. S. P. 1 882 146, Oct. 11, 1932, application filed July 31, 1930; Harry N. Holmes.

IN THE desulfurization of gasolines and other hydrocarbon oils, chemical methods are undesirable because of their chemical effects on the oil being treated. But desulfurization by adsorption, even though it lacks the harmful effects of chemical methods is ineffective with respect to certain kinds of sulfur compounds, especially the thiophenes.

It has now been found that effective desulfurization by adsorption can be accomplished even when the oil contains thiophenes. In the new process, desulfurization is effected in two stages; first a cheap, simple adsorbent is used, e. g. an iron-silica gel, which removes free sulfur, hydrogen sulfide, alkyl sulfates, sulfonic acids, carbon disulfide, thioethers and mercaptans, but not thiophenes; then an absorbent is used which has been found to be effective even with respect to thiophenes, for example a silica gel having a sulfide of lead or of copper deposited within its pores. Thus the latter agent does its work unhindered by any burden of removing the more easily removable sulfur compounds.

What is Claimed

Purifying hydrocarbon mixtures which contain both less readily and more readily removable sulfur compounds, by treatment first with an iron-silica gel or the like to remove the more easily removable sulfur compounds, and then with a gel containing a metallic sulfide thoroughly disseminated through its pores, to remove the less easily removable sulfur compounds.

* * *

Sweetening Gasoline. U. S. P. 1,888 219, Nov. 22, 1932, application filed Sept. 24, 1930; Hugh Harley Cannon, assignor to Cannon-Prutzman Treating Processes, Ltd.

THE gasoline sweetening reagent which is made by mixing calcium hydroxide with lead monoxide, adding water or a sodium hydroxide solution, and making into a powder with diatomaceous earth is effective when fresh, but has serious disadvantages. One is that it does not, as formerly believed, long retain its original efficacy; another is the high production cost introduced by the difficulty of making a satisfactory powder from the ingredients. This difficulty is due to a conglomerating tendency, which also interferes with the most efficient action of the powder when introduced into gasoline.

These drawbacks have now been overcome by a radical departure from the previous methods of preparing the reagent. The order of introducing the ingredients is reversed; that is, the diatomaceous earth is first prepared in proper physical condition and the calcium hydroxide and lead monoxide are then added. Moreover, the reagent is prepared in oil, not in water, and is made up into a slurry of desired thickness, no trouble being encountered because there is no conglomerating tendency. The oil may either be the gasoline to be treated, so that the reagent is used as formed, or an oil which can be blended with the gasoline, in which case the slurry may be made up in batches a day or two in advance of use. There is no loss in efficacy as in the old method of preparation.

What Is Claimed

Preparing a sweetening reagent of litharge, alkaline earth hydroxide and absorbent earth in solid comminuted form, with an aqueous component, by intimately mixing the components in suspension in the minimum amount of an oil, namely less than the amount to be treated.

* * *

Lubricants. U. S. P. 1 888 346, Nov. 22, 1932, application filed May 26, 1927; divided and this application filed Sept. 10, 1928; Homer T. Darlington, assignor to Oil Corp. of America.

TO IMPROVE the service quality and life of lubricating oils, it is necessary to minimize the tendency to form and deposit carbon under severe conditions, as in internal combustion engines. It is also necessary to prevent gum formation, which seriously interferes with lubrication.

Both of these objects can be achieved by a suitable treatment with a solid adsorptive colloid. Among the effective colloidal agents are bentonite, hydrated lime, sponge iron, siliceous residues from acid treated clay, and the like. Such an adsorbent is colloidally dispersed in the oil and the dispersion is heated at 500 to 850°F. at atmospheric or higher pressure. This treatment is effective in neutralizing or removing impurities which lower the stability of the oil and tend to cause carbon formation. If it is also desired to prevent gum formation, an oxidizing gas such as air is blown into the hot oil. The product of this treatment is of excellent quality; indeed, the method is even applicable to recovery of used lubricating oils for re-use.

What Is Claimed

For producing lubricating oils, a vaporizing chamber containing distributor plates to provide large surface area, means for introducing oil and dispersed adsorbent and for repeated circulation of the material through a heater, means for introducing adsorbent before the circulating material passes through the heater, means for withdrawing carbon and sediment from the vaporizing chamber, an agitator in the chamber, a dephlegmator connected to the vaporizer and having separately connected progressively cooler zones, from any of which condensate can be withdrawn, and means for evacuating dephlegmator and vaporizer.

Socony Raises Gasoline

NEW YORK, April 4.—The Standard Oil Co. of New York on April 5 will advance tank wagon and service station prices of gasoline 1 cent through New York state and New England, according to an announcement made today.

The last general change through territory was a 1 cent cut Jan. 4.

Laurel Refinery Purchased By Security Holders

TULSA, April 1.—Purchase of the old Laurel Oil & Ref. Co.'s plant near Billings, Mont., is reported the purchase being affected by William Rice, representing a group of security holders of the original company.

It is reported that the plant is to be revamped and put into operation soon. Reorganization of the company has been practically completed, it is stated, and material has been ordered for revamping the entire plant, which has been inactive for about three years. After the first completion and operation of the plant considerable litigation was carried on between the refining company and the construction company, after which the plant was shut down. The plant will run Oregon Basin and Cat Creek crudes when it is again in operation.

Dr. Washburn to Address Oklahoma Chemists

TULSA, April 1.—Dr. E. W. Washburn, chief of the division of Chemistry, U. S. Bureau of Standards will discuss "Isolation of Pure Hydrocarbons from Petroleum" before the petroleum group of the Oklahoma section, American Chemical Society, in Tulsa, April 8. The meeting will be held in the Chamber of Commerce dining room, and will be preceded by a dinner at 6:00 p. m.

The work which the speaker will describe has been prosecuted at the Bureau of Standards under his direction, financed by grants from the American Petroleum Institute. Most of the investigations have been on Mid-Continent crudes.

On The Lazy Bench

Wanted a Change

Judge, severely to prisoner: "Now, tell me, why did you steal that purse?'

Prisoner: "Yer honor, I won't deceive you. I was not feeling well, and I thought the change might do me good."

—"The Oil Can"
—Illinois Petroleum Marketers Assoc.

* * *

Hot Down There

A preacher was describing the Bad Place to a congregation of shellbacks.

"Shipmates," he said, "you've seen the molten iron come running out of the furnace, haven't you? It comes out while hot, sizzling and hissing like some snaky, horrible monster. Well, shipmates—"

The preacher pointed his finger at the awed shellbacks.

"Well, shipmates," he said solemnly, "they use that stuff for ice cream in hell."

—The Pure Oil News
The Pure Oil Co.

* * *

When the Dove Coos

Magistrate (to woman involved in matrimonial dispute)—"Did you and your husband quarrel on Friday night?"

Wife—"And the next day, pay day! Certainly not!"

—The National Dixie Booster,
The Dixie Distributors.

* * *

If you feel ambitious to argue with a mule—do it to his face.

—"The Oil Can"
—Illinois Petroleum Marketers Assoc.

* * *

Me-e-e-o-o-o-o-w!

"Johnny," said his mother, "run across the street and see how old Mrs. Brown is this morning."

Johnny returned in a few minutes and reported:

"Mrs. Brown says it's none of your business how old she is."

—The Safe Driver
National Safety Council, Inc.

* * *

"What game of bridge does your wife play?"

"Judging from the cost I think it must be toll bridge."

—"The Oil Can"
—Illinois Petroleum Marketers Assoc.

* * *

Very Likely

Barber—"You are very bald, sir. Do you know what is the cause of it?"

Feddup—"I don't know, but I suspect that my hair falling out had something to do with it."

—The National Dixie Booster,
The Dixie Distributors.

* * *

"Are your fruit trees bothered much by pests?"

"No, my place isn't near the main road."

—"The Oil Can"
—Illinois Petroleum Marketers Assoc.

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research in field and laboratory, the use of superior crude oils, and the most modern refining equipment are the three stones in the foundation upon which Humble quality has been built.

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Yes—I'm one that is always promising myself "my own personal copy" of NATIONAL PETROLEUM NEWS each week. So here goes! Send me the next 52 issues for which I enclose $3.50. (Foreign $5, Canada $6, including tax.)

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New Equipment

UNITED STATES AIR COMPRESSOR CO., Cleveland, O., with 26 sales and service branches in the United States and in 10 foreign countries, has made the following changes in sales representatives, according to K. S. Clapp, sales manager:

W. V. Hall, assistant sales manager, formerly under Leo Spalding, eastern manager, has assumed complete charge of greater New York City territory, with headquarters at 246 W. 65th St.

White-Tucker Co. of Texas, comprising J. Cross White, 610 Binz Bldg., Houston, and J. Milton Tucker, 408 Construction Bldg., Dallas, has taken over distribution of U. S. Air Compressor products in Texas except in the southwestern portion, and in New Mexico.

P. I. Schultz, formerly chief engineer, becomes assistant sales manager and advisory engineer, with the title of sales engineering executive.

* * *

THE LUMMUS CO., New York, has issued Bulletin E-1 describing its new high pressure heat exchangers for which it claims efficient operation, simplified cleaning and reduced maintenance costs.

* * *

A NEW lever-operated specialized hand gun for lubrication work has been developed by the Cincinnati Ball Crank Co., Cincinnati, O. It is called the Balcrank lever-push specialized lubricator.

It is pushed against Zerk fitting by either hand or body. The grease piston forces lubricant on a straight line and in the same direction as the hand or body pressure pushes the unit against the fitting, eliminating "gun wobble."

The lever is operated with none of the tiring effort and hard work of the push type guns, the company points out. Shoulder pressure permits easy, one-man operation.

The manufacturer emphasizes the fact that it is lever-operated, and not a scissors nor push-type hand gun, and that it is more efficient, more powerful and easier operated.

* * *

GENERAL ELECTRIC CO., Schenectady, N. Y., has published a bulletin on the G-E totally enclosed squirrel-cage motors, type K, described as having ample radiating surface to insure proper cooling without the use of external fans. Among the features are steel end frames and silicon-steel laminations rigidly held together by rivets; uniform electrical characteristics; one-piece rotor winding with fans cast integral; grease-lubricated ball bearings and dual voltage connection of stator winding for 220 and 440-volt stators.

* * *

A CONSTRUCTION improvement, said to protect against blow-outs, is announced in automobile tires by the B. F. Goodrich Co., Akron, O. This improvement is a ply made of a special compound which resists internal heat and friction, the company says.

The new tire employing the ply development was tested at high speeds, revealing that it gave three times the blow-out protection to be had in standard tires without the safety ply, S. B. Robertson, vice-president, declares.

* * *

THE largest cab order received this year west of Detroit by the General Motors Truck Corp., Pontiac, Mich. was for 60 for the General Transportation Co., St. Paul. These cabs are the new General model O-14. They left the factory the latter part of March.

New Balcrank lubricator that is lever-operated

A NEW package has been designed for Fleetwing auto polish which is said already to have proven its sales appeal, according to the Owens-Illinois Glass Co., Toledo, O. That company, in collaboration with the Fleetwing Oil Corp., Cleveland originated the idea.

The container is a tall bottle of red (applied color) glass. Its side lines spread to a broad base, giving a modernistic effect. Label is of clean-cut poster type, in cream color. A molded white cap sets off the package, giving it the suggestion of cleanliness. The bottle is cellophane-wrapped. A white polishing cloth is enclosed within the cellophane wrapping.

* * *

B. F. CONNELLY, 1370 Goodyear Ave., Akron, O., former field agent of the Tri-County Petroleum Club of Ohio and Akron oil jobber, has developed with R. E. Castetter of Cincinnati, a motor oil display cabinet for use outdoors at service stations.

The cabinet has animated and illuminated display by means of lighted glass tubes for the oil through which air bubbles pass. It is made at present in two lengths—30 and 60 inches. The smaller size has one tube and the larger size three tubes. The tubes are about six inchs in diameter with globes at the top. The globes have chromium plated covers.

Five of the larger size have just been shipped to one of the large middle western refining and marketing companies. These cabinets have space for 24 one-quart bottles which also are illuminated. On each of the broad sides of the cabinets' bases are three circular cut-outs in which glass panels bearing decalcomanias of the oil company's motor oil trademark have been inserted. The decalcomanias are also illuminated.

Covers for the cabinets are in two sections for removal when the station is open. At night the covers may be locked in place as the cabinets are intended to be left outdoors.

* * *

THE Ludlow Valve Manufacturing Co., Troy, N. Y., has recently appointed the J. W. Frazier Co., 626 Western Reserve bldg, Cleveland, O., as its representative in Northern Ohio.

THE SIXTH OF AN INTERESTING SERIES OF PHOTOGRAPHS

Many greases demand such thorough, careful manufacture, that individual kettles, constant technical control and the experience of skilled grease makers are essential to uniformity and quality. And Bat believes that such painstaking care and special equipment are necessary to the production of special greases.

BATTENFELD GREASE AND OIL CORPORATION

KANSAS CITY, MISSOURI

BRANCH OFFICE AND WAREHOUSE STOCK: MINNEAPOLIS, MINN.

"Business is Ingreasing"

"Gum Inhibiting Index"

(*Continued from page 32*)

in water and only slightly soluble in gasoline would readily be extracted from the gasoline by contact with water. The variation in this partition ratio is shown in Table 6 for several inhibitors.

Those compounds having a solubility ratio considerably greater than one would be the most satisfactory in this respect. Compounds showing a solubility ratio of less than one would be unsatisfactory as they could readily be extracted from gasoline by contact with water.

It is known that ageing of gasoline causes a loss of anti-knock value which cannot be explained solely by the loss of the highly volatile fractions. Apparently the presence of oxidation products is responsible for this and it is therefore not an independent factor but related to gum formation.

Gum formation inhibitors should therefore also inhibit for loss of octane number rating. Several inhibitors have been examined for this property by determining the octane number of samples of gasoline before and after oxidation by the method previously described.

The use of gum inhibitors for the stabilization of cracked gasoline is proving to be an economically sound treating process, as it permits the production of high anti-knock gasoline which can be stored for suitable periods of time without excessive formation of gum. Many organic compounds have been found which have this property of gum stabilization. However, for commercial use as a gum inhibitor such materials must not only inhibit gum formation but they must do so at a minimum cost. They must also have certain other requirements, among which may be included no formation or color or loss of color stability, a satisfactory solubility ratio in gasoline and in water, and must also act as octane number stabilizers.

Literature Cited

[1]Wagner and Hyman
Am. Petr. Inst. Proc. (10th Ann. Meeting) *11* (1) Sec. 111, pp. 118-123 (1930)
[2]Verhees and Eisinger
Am. Petr. Inst. Proc. (9th Ann. Meeting) Ref. Tech. Sec. *11*, p. 169 (1929)
[3]Egloff, Lowry, Morrell and Dryer
Correlation of Inhibiting Actions and Oxidation-Reduction Potential
A. C. S. Meeting, Petr. Sec., August, 1932, Denver, Colo.

Sheridan Plant Operating

CASPER, Wyo., April 1.—Operation of the 150-barrel refinery of Sheridan Ref. Co. at Sheridan, Wyo. has begun. The plant is operating on crude from Osage field. The plant was designed and built by E. G. Griffith, of Casper.

Plans are under way to erect a service station at the refinery, to serve retail customers.

Waldo Emmerson

Emmerson Heads Hyvis Sales for Barber

CHICAGO, April 3.—Waldo Emmerson, well known to middlewestern oil marketing trade, has joined the W. H. Barber Co. here to manage its special Hyvis sales department. The company has become exclusive distributor in Chicago territory for Hyvis motor oils and lubricants, made by Hyvis Oils, Inc., Warren, Pa.

Mr. Emmerson was formerly in charge of sales in this territory for the Vacuum Oil Co., and for 12 years previous to that for the Tide Water Oil Co.

C. G. Collingwood has been appointed assistant manager of the Hyvis department.

The Barber company is one of the well established independent wholesale oil marketers in the middlewest. Its headquarters are in Minneapolis.

Albert J. Squier Heads New York Oil Trades

NEW YORK, April 1.—Albert J. Squier, recently appointed representative in metropolitan New York for the Tiona Petroleum Co., Philadelphia, was elected president of the Oil Trades Association of New York, Inc. at its annual meeting at the Waldorf-Astoria, March 28. Mr. Squier succeeds Clifford T. Weihman, Smith-Weihman & Co., who served as president for three years.

Other officers elected were: J. Walter Saybolt, Standard Oil Co. of New Jersey, vice-president; and George Suraud, Chelsea Oil & Supply Co., treasurer, succeeding William S. Williams and Philip C. Meon respectively. Joseph C. Smith, Smith-Weihman & Co., remains secretary.

Directors elected were: Clifford T. Weihman; Dr. Charles V. Bacon; John W. Baker, president, Philippine Refining Co.; William H. Correa, director, Standard Oil Co. of New York; W. Miner Osborn, of Zimmerman, Alderson & Carr; John F. Renick, Renick & Mahoney; Lawrence A. Ryan, Fiske Bros. Refining Co.; and Rudolph G. Sonneborn, president, L. Sonneborn Sons, Inc.; also these officers: Mr. Squier, Mr. Saybolt and Mr. Smith.

A dinner in the roof garden of the hotel preceded the election of officers. Mr. Squier, familiarly known as "Bert," has been prominent for many years in the New York oil trade and served in 1918 and 1919 as second president of the association. His return to office was acclaimed by all.

Tiona Has New Representatives

PHILADELPHIA, April 1.—Following the election of Albert J. Squier as president of the Oil Trades Association of New York, Inc., published elsewhere in this issue, comes an announcement from the Tiona Petroleum Co., Philadelphia, that Mr. Squier and his associate, William B. Gallagher, recently were appointed representatives in metropolitan New York City for that company. Mr. Squier's offices are in the Starrett-Lehigh Bldg., 601 West 26th St.

Frank J. Cortan, the company's former representative in New York, has joined the Pennsylvania Lubricating Co. of Pittsburgh, according to S. P. Worthington, president of the Tiona.

Dealer Files Indianapolis Pump License Suit

INDIANAPOLIS, March 31.—The suit attacking the gasoline pump license tax imposed by the city of Indianapolis, was filed in the circuit court at Indianapolis March 29 in the name of the McClain Tire Co. The suit is sponsored by all the leading gasoline distributors in the city. The annual license fee is $15 a pump.

The defendants in the suit are the mayor and other officials of Indianapolis who are charged with the enforcement of the license ordinance. About 3000 pumps are affected by the litigation.

To Reclaim Old Oil

TORONTO—G. M. Scharf and A. G. Charrett have organized Tripoli Products, Ltd. at Regina, Sask., to re-refine used crankcase motor oil.

FATIGUE-PROOF TIRES

cut costs FOR OIL INDUSTRY

FOR the first time in the history of tire design, Kelly-Springfield engineers have developed tires to resist *Fatigue* — science's name for the cause of tire wear and destruction. The net result of the new secret processes, methods and materials is a never-before-known ruggedness and wear-resistance. That is why the new *Fatigue-proof* tires are making such startling mileage economy records in the oil industry. For mileage and for stamina no tires like the new *Fatigue-proofs* were ever made before.

Know the points of superiority in these great new tires, see the records they are making, and you will demand them for your fleet. *You can equip with Fatigue-proofs at no extra first cost over ordinary tires.* Kelly-Springfield Tire Company, 1775 Broadway, New York.

FATIGUE-PROOF

6 TIMES FORTIFIED

NO EXTRA COST

1 *Corkscrew cotton* — a Kelly-Springfield discovery. . . . Scarce, expensive, far kinkier than ordinary cotton. . . . Used only in these tires.

2 *Gum-inforced plies* — an enormous improvement in tire building. Pure rubber compounds, under tons of pressure, are forced right into the weave.

3 *Prime first rubber* — only used in these tires (there are 5 grades of raw rubber), none of the cheaper, inferior grades used in other tires.

4 *Vitalized rubber treads* — bigger, deeper, thicker. . . . New vulcanizing agents. . . . New secret processes. . . . Never-before-known mileage.

5 *Non-skid*—wide, deep grooves. . . . Perfectly balanced treads. Positive, lasting non-skid protection.

6 *Made by the new Monitor System* — our system of factory control of every material and every process—then tested by mountain fleets on the world's toughest testing grounds.

KELLY-SPRINGFIELD

Cut Storage Losses

OCECO

Vent Valves Limit Evaporation

The savings soon pay for the vent valves and return a big profit. Present connections on old tanks usually adaptable for attaching new fittings. We'll show you how. Write to—

THE OIL CONSERVATION ENGINEERING CO.

877 Addison Rd., Cleveland, O.

NEW STATIONS BUILDING

Note: Material used in this column is taken principally from newspapers. NATIONAL PETROLEUM NEWS assumes no responsibility for its accuracy. Headquarters of companies and addresses of individuals are given wherever possible.

The list as published from week to week cannot be looked upon as indicative of the relative extent to which stations are being built in various parts of the country.

Service Stations

Brooklyn, N. Y.—Navillus Realty Corp.; Sadie Smith; Carl E. & Johanna Anderson; 88 Holding Co., Inc.; Jane David Holding Corp.

Dedham, Mass.—Francis E. Brown.

Marshfield, Wis.—Mrs. Emelia Bauman.

Danville, Ill.—Standard Oil Co. of Indiana, 910 S. Michigan Ave., Chicago, Ill.

Fremont, Ohio—Ellis Filling Station.

Minden City, Mich.—Harry Dawson.

Fairmont, Minn.—A. M. McAninch.

Rice Lake, Wis.—Erickson Motor Co.

Deadwood, S. D.—Standard Oil Co. of Indiana, 910 S. Michigan Av., Chicago, Ill.

Cedar Rapids, Ia.—Phillips Petroleum Co., Bartlesville, Okla.

Milwaukee, Wis.—Steve Ulik, 1004 East Brady St.

Minier, Ill.—Clarence Singley.

Lincoln, Ill.—The Lincoln Oil & Refg. Co., Robinson, Ill.

Watseka, Ill.—Baron-Huot Oil Co. of Kankakee.

Creston, Ia.—Skelly Oil Co., El Dorado, Kan.

Lincoln, Nebr.—J. E. Trumble, 5601 Huntington Av.

Freeport, Ill.—Max Liebling, 318 N. Gardiner Av.

Memphis, Tenn.—C. L. Allen.

Columbus, Ohio—A. K. Schrawger, 572 E. Rich St.

Orleans, Ind.—Standard Oil Co. of Indiana, 910 S. Michigan Av., Chicago, Ill.

Cranford, N. J.—Hudson Union Co.

Granite Falls, Minn.—The Minnesota Oil Co., Willmar, Minn.

Kansas City, Mo.—J. L. Cashen; Glen-Coe Realty & Investment Co.; E. C. Senter.

Beaumont, Tex.—Sinclair Refining Co., 45 Nassau St., New York.

Waterbury, Conn.—Peter Benny & William Litke.

Mt. Vernon, N. Y.—Charles Day.

Hempstead, N. Y.—Henry Allendorf; Charles V. Smith.

Northfield, Minn.—Skelly Oil Co., El Dorado, Kan.

Centerville, Ia.—Farm Bureau Service Co.

E. Hartford, Conn.—Morris Riben.

Brooklyn, N. Y.—Frederick Prisco; Peter Fiore; Gaetano Quaranto; Raymond McCool; Wim Holding Corp.; Samuel Seides; Bliss Estates, Inc.; J. Chester Sneath; Max Goldman; Isaac Levingson; The Nod-Away Co., Inc.

Sioux City, Ia.—F. Henningfeld.

St. Paul, Minn.—D. H. Michaud, 909 Guardian Bldg.

St. Joseph, Mo.—Sinclair Refining Co., Conway Bldg., Chicago, Ill.

Pittsburg, Kan.—Sinclair Refining Co., Conway Bldg., Chicago, Ill.

Omaha, Neb.—Sinclair Refining Co., Conway Bldg., Chicago, Ill.

Morrison, Ill.—Howard Buckley, Springville, Ia.

Milan, Mich.—Moreland Gasoline Co., Adrian, Mich.

Oneida, N. Y.—M. J. Kallett.

East Orange, N. J.—Edward H. Backes, 2 Overhill Road, South Orange, N. J.

Lebanon, Ill. — George Behrens, O'Fallon, Ill.

Cambridge, Mass.—George A. MacDonald.

Glen Ridge, N. J.—H. Germander, 446 Broad St.; Martin Hummell Estate, 347 Broad St.; and T. Paxton, 1414 Broad St.

Bloomville, O.—E. C. Walter.

Sandusky, O.—Everett Seymour.

Cincinnati, O.—Gulf Refining Co., Gulf Bldg., Pittsburgh, Pa., five stations.

Bluffs, Ill.—Burl Bridgemen.

Morrison, Ill.—American Petroleum Co., Davenport, Ill.

Danville, Ind.—Sinclair Oil Co., 45 Nassau St., New York, N. Y.

Delta, O.—Paul Hartley.

Sioux City, Ia.—T. O. Torgerson, 1701—33rd St.

Dubuque, Ia.—W. J. Roth, 61 Alpine St.

Lewistown, Mont.—Marcus Stendal, c/o Stendal Transportation Co.

Austin, Minn.—Anton Lukes.

Beresford, S. D.—Ivan Larson.

Guthrie Center, Ia.—Continental Oil Co., Ponca City, Okla.

Anamosa, Ia.—Continental Oil Company, Ponca City, Okla.

Carroll, Ia.—Continental Oil Company, Ponca City, Okla.

Yonkers, N. Y.—Alexander Roseff.

Chambersburg, Pa.—Sun Oil Company, 1608 Walnut St., Philadelphia, Pa.

West Alexandria, O.—O. J. Limes & Son, Lewisburg, O.

Newton Centre, Mass.—Standard Oil Co. of New York, 26 Broadway, New York, N. Y.

Fremont, O.—James Ellis.

Olney, Ill.—Eugene Hahn, South Bend, Ind.

Omaha, Neb.—Sinclair Refining Co., 45 Nassau St., New York, N. Y.

Monticello, Ky.—The South Kentucky Pipe Line Co., Somerset, Ky.

Steubenville, O.—Fred H. Gatho, Bridgeview Ave.

Waterloo, Ia.—Standard Oil Co. of Indiana, 910 S. Michigan Av., Chicago, Ill.

Kansas City, Mo.—Skelly Oil Co., 2534 Madison Ave., Kansas City, five stations; one each at St. Paul, Mankato and St. Peter, Minn.; Ellsworth, Kan., and Independence, Ia.

New York City—Sinclair Refining Co., 45 Nassau St., four stations at Dallas, Tex.; one at Houston; and one at Neosho, Mo.

Pittsburgh, Pa.—Gulf Refining Co., Gulf Bldg., two stations; one at Columbus and Cheviot, O.

St. Louis, Mo.—Circle "D" Service, Inc., four stations at St. Louis, one at Clayton, Mo.

Coffeyville, Kans.—J. R. Donaldson.

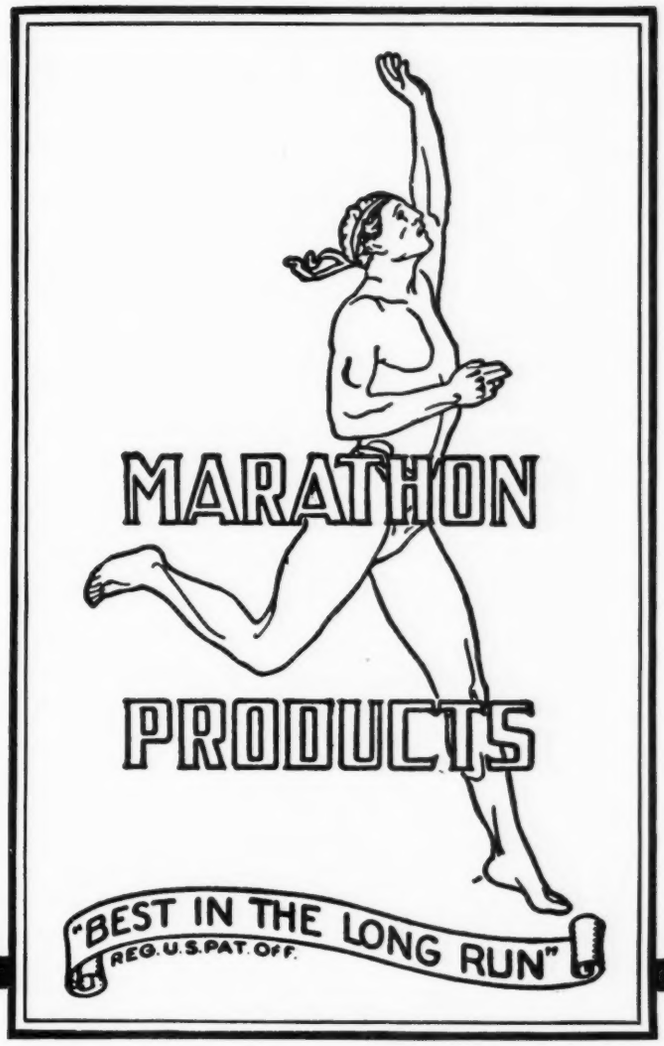
Hutchinson, Kans.—Security Oil Co., 1005 Shute St., Ft. Scott, Kan.

Troy, O.—John Rudisill.

Anna, O.—Anna Oil Co.

Danville, Ky.—W. P. Caldwell.

St. Paul, Minn.—Mrs. Angelina Gentile, 479 Collins St.



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You may confidently depend upon CHAMPION Compressors—year in and year out—to give you the desired volume of air at all times, and at less cost.

CHAMPION Upright Model TU-54, shown here, has a capacity of 7.2 cu. ft. per minute, 65-gal. Tank. Other models up to 20 cu. ft.

Write for complete information

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150 and 200 Viscosity Pennsylvania Neutrals

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Warren, Pa.

Refining 100% Penna. Crude exclusively for 32 years.

OIL STOCKS AND FINANCES

Barnsdall Writes Off 33 Million In Value of Capital Assets

CLEVELAND, April 3

BARNSDALL CORP. last year wrote off $33,218,469.72 in capital assets by valuing on its books all developed and undeveloped oil and gas leaseholds at $1, writing equipment down to present day going values and charging off everything that was reasonably obsolescent.

Placing its production properties on a nominal valuation only and bringing its plant and equipment values down to today's levels was accomplished by reducing the par value of its capital stock from $25 to $5 a share and creating a capital surplus against which the reductions in valuations were charged.

Total assets of the corporation and subsidiaries Dec. 31, 1932, were down to $28,841,678, compared with $63,415,942 at the end of 1931. Reductions were as follows:

Oil and gas leaseholds	$21,063,273.12
Mineral lands and leaseholds	1,941,717.30
Additional depreciation and equipment obsolescence	7,900,100.07
Stock and bond investments	667,335.53
Treasury stock	490,915.90
Other assets	1,155,127.80

By eliminating depletion and lease abandonment charges and reducing depreciation charge, the corporation was able to show improvement in its earnings statement over that of 1931. The net loss last year was $847,072, compared with $3,268,637 in 1931. Of the 1932 loss, $668,882 was attributable to the fact that the company charged all well drilling and acquisition of new leases to profit and loss, President E. B. Reeser informed stockholders.

Barnsdall's balance sheet of Dec. 31, 1932, shows current assets totaling $7,251,940.26, including $801,684.05 cash, and current liabilities totaling $4,336,291.39. At the end of 1931 current assets were $7,504,749.37, including $915,024.49 cash, and current liabilities $3,812,410.67. Bank loans were reduced from $2,000,000 Jan. 1, 1932, to $1,509,143 Dec. 31.

The only indebtedness due after one year was purchase money obligations totaling $96,910.59. The company has no bonded debt or preferred stock senior to the 2,258,779 shares of common stock.

Production figures the last two years compare:

	1932	1931
Natural gas, M. cu. ft.	4,150,670	5,758,161
Crude oil bbls.	4,714,577	6,308,164
Natural gasoline, gals.	11,685,115	15,615,178
Refined products, gals.	112,424,353	130,360,361
Coke, tons	6,160	4,446

Crude oil production was curtailed last year because of proration. The average price received was 92 cents a barrel, compared with 71 cents in 1931 and $1.34 in 1930. The average price received for gasoline at the refineries was 4.46 cents a gallon last year, compared with 3.5 cents in 1931, and 6.3 cents in 1930. The average price received for fuel oil was 37 cents a barrel, compared with 31 cents in 1931, and 70 cents in 1930.

Barnsdall acquired remaining outstanding interests in marketing companies in which it has held half interests. Mr. Reeser said the company has completed its plans for intensive distribution along the Great Lakes pipeline in which it is interested.

At the end of 1932 Barnsdall had 81 fewer outlets for its products than at the end of 1931. At the end of last year

Income Statements of Barnsdall Corp. and Subsidiaries

	1932	1931
Gross income	$13,949,100.40	$13,776,163.55
Costs, operating, general expenses, taxes	12,337,225.16	12,026,039.96
Net operating income	$ 1,611,875.24	$ 1,750,123.59
Other income	500,635.75	55,695.03
Total income before interest, reserves	$ 2,112,510.99	$ 1,805,818.62
Interest	154,582.61	114,859.69
Depreciation	2,169,990.28	2,721,963.03
Lease purchases	107,064.87	.....
Intangible development costs	561,817.51	1,238,897.92
Depletion, abandonments	.....	1,023,388.82
Loss applicable to minority interests	33,872.05	24,653.58
Net loss	$ 847,072.23	$ 3,268,637.26

it owned 244 bulk plants, compared with 261 at the end of 1931; 479 controlled service stations and 2822 contract outlets, compared with 699 and 2666, respectively, a year earlier.

The contraction in number of controlled service stations was mainly in Iowa, Nebraska, South Dakota, and Wisconsin. The gain in number of contract outlets was largely in Wisconsin, North Dakota, Indiana and Illinois.

Mr. Reeser reported earnings of the Great Lakes pipeline was greater than had been expected. He said most of the "other income" shown in the earnings statement ($500,635.75) was dividends from this gasoline carrier.

Asphalt to Alter Capital, Write Down Assets

PHILADELPHIA, April 1.—General Asphalt Co. plans readjustment of capital asset valuations through a readjustment of its capital stock structure. Stockholders will vote on a proposal at their annual meeting April 26.

The plan, as announced, is to give the present no par common stock a par value of $10 a share. There were 413,333 shares outstanding last Dec. 31 of 1,000,000 authorized. New stock would be issued share for share for the no par stock.

The present no par stock is carried on the books at $36,117,130. Under the plan a capital surplus account of approximately $32,000,000 will be created. Against this account property values will be written off or written down. The company announced that although certain of its properties and mineral reserves have appreciated in value since they were acquired, no writing up of values will be done.

The write-offs will amount to around $21,350,000, the company indicates in the notice of the special meeting. This operation will relieve future earnings of heavy charges for depreciation, depletion and amortization. The new stock, after adjustments, will have a book value of approximately $48 a share, it was announced.

General Asphalt had a net loss of $621,268 in 1931 compared with net loss of $20,065 in 1931. Current assets Dec. 31, last, totaled $5,242,148, including $2,024,271 cash. Current liabilities were $719,334. A year before current assets were $5,857,670, including $2,433,815 cash, and current liabilities $623,837. Long term debt Dec. 31, last, amounted to $147,000, compared with $185,000 a year earlier.

Total assets Dec. 31, 1932, were $43,990,857, after depreciation, depletion and amortization, compared with $44,973,516 at the end of 1931. Under the reorganization plan a considerable portion of asset valuation will be written off the books.

Earned surplus Dec. 31 1932, was $6,837,198 after payment of 50 cents a share dividend last year.

Changes in Tank Wagon Markets

(Continued from Page 61)

Fuel Oil

Following are tank wagon prices of various grades of fuel oil at the points shown in various territories. Prices are in cents per gallon:

Prices in Effect April 3, 1933

	No. 1	No. 2	No. 3	No. 4
S. O. New Jersey				
	T.W.	Tax		Total T.W.
Newark, N. J.	8	6.5	....	6
Atlantic City, N. J.	8	6.5	....	6
Baltimore, Md.	6.5	5	....	5
Washington, D. C.	8.25	6.75	....	6.25
S. O. New York				
New York City	7	6.5	6.5	5.5
Albany, N. Y.	7	6.5	6.5	5.5
Rochester, N. Y.	7	6.5	6.5	5.5
Boston, Mass.	7	6.5	6.5	5.5
Augusta, Me.	7	6.5	6.5	5.5
Manchester, N. H.	7	6.5	6.5	5.5
Burlington, Vt.	7	6.5	6.5	5.5
New Haven, Conn.	7	6.5	6.5	5.5
Providence, R. I.	7	6.5	6.5	5.5
Atlantic Refining				
Philadelphia, Pa.	7.5	6	5.5	....
Allentown, Pa.	8.5	7	7	....
Wilmington, Del.	8	6.5	6	....
Springfield, Mass.	7	6.5	6.5	....
Worcester, Mass.	7	6.5	6.5	....
Hartford, Conn.	7	6.5	6.5	....
S. O. Ohio				
Cleveland	7.5	6.5	6	....
Columbus	7.5	6.75	6.25	....
Cincinnati	7.5	6.75	6.25	....
Toledo	7.5	6.75	6.25	....

Note: S. O. Ohio prices are for hose dumps; bucket dumps are 0.5c per gallon higher.

S. O. Indiana
Stanolex Fuel Oil No. 1

Chicago, Ill.	9
Indianapolis, Ind.	*13.4
Detroit, Mich.	9
Madison, Wis.	9.8
Minneapolis, Minn.	10.1
Sioux City, Ia.	8.6
St. Louis, Mo.	8.9
Kansas City, Mo.	7.8

*Includes state tax of 4c.

Discounts: at Chicago, Indianapolis and Detroit, 2c off t.w. price for deliveries of 100 gals. and over; at other above points, 2c off t.w. price for deliveries 50 gals. and over.

Oil Dividends

Declared Last Week

Company and Period	Amount	Stock of Record Payable
Consolidated Royalty q.	5c	Apr. 25 Apr. 15
Devonian Oil q.	15c	Apr. 20 Mar. 31

Awaiting Payment

April 1, 1933

Company and Period	Amount	Stock of Record Payable
Indiana Pipe Line s.a.	15c	May 15 Apr. 28
Kirby Petroleum	10c	Apr. 15 Mar. 31
McColl Frontenac pfd. q.	$1.50	Apr. 15 Mar. 31
New York Transit s.a.	15c	Apr. 15 Mar. 24
Southland Royalty q.	5c	Apr. 15 Apr. 1
S. O. Ohio pfd. q.	$1.25	Apr. 15 Mar. 31

Paid Past Week

Company and Period	Amount	Date Paid
British American Oil q.	20c	Apr. 1
Canfield Oil pfd. q.	$1.75	Mar. 31
Canadian Oil pfd. q.	$2	Apr. 1
Chesebrough Mfg. q.	$1	Mar. 31
do pfd.	50c	Mar. 31
Humble Oil q.	50c	Apr. 1
Mountain Prod. q.	20c	Apr. 1
N. American Oil.	10c	Apr. 1
N. Cent. Texas pfd. q.	$1.62½	Apr. 1
Pure Oil 5¼% pfd. q.	37½c	Apr. 1
do 6% pfd. q.	37½c	Apr. 1
do 8% pfd. q.	50c	Apr. 1
South Penn Oil q.	25c	Mar. 31
S. W. Pa. Pipe Lines q.	$1	Apr. 1
The Texas Corp. q.	25c	Apr. 1
Texon Oil & Land q.	25c	Mar. 31

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MARKETING EXECUTIVE, experienced in retail and refinery sales, traffic, lubrication and grease. Practical bulk, marine terminal and service station operation. Address Box 978.

Situations Open

GREASE MAKER wanted in middle western city. State age, salary expected, experience, religion. Confidential. Address "Grease Maker," care National Petroleum News.

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Another lot of 10-gallon Americans, Frys and Correct Measures. In good mechanical condition, $15 each, FOB Boston.

Also twelve 3" McDonald double swing joints, $5 each.

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Transactions in Oil Shares on New York Stock Exchange

1932 High	1932 Low	1933 High	1933 Low	Listed Shares	Par Value	Company	Div. Rate Period	Last Div. Paid	Transactions Week Ended April 1 Sales Shares	High	Low	Last	Week's Change
22¾	12	22⅛	18½	922,070	N.P.	Amerada Corp.	50cQ	Jan. 31, 33	1,900	21½	21	21	— ½
16½	6½	16	6¾	2,240,000	$25	Associated Oil Co.	25cQ	Dec. 31, 32	.....	.....	.....	.....	.....
21⅞	8⅝	17¼	12⅜	2,696,652	25	Atlantic Refining Co.	25cQ	Mar. 15, 33	5,300	15⅜	14⅝	.....	.....
7	3⅜	4¼	3	2,258,779	5	Barnsdall Corp.	....	May 11, 31	5,500	3⅜	3¼	3½	— ¼
12½	9	12	10½	1,444,970	N.P.	Colonial Beacon Oil Co.	....	.....	.....	.....	.....	.....	.....
9	4	6¼	5	14,218,835	N.P.	Consolidated Oil Corp.	....	.....	13,900	5⅝	5¼	5½	+ ⅜
101	79	100¼	95½	136,012	$100	do pfd.	$2Q	Feb. 15, 33	200	98⅛	96½	96½	0
9⅜	3⅝	6⅜	4⅞	4,722,432	N.P.	Continental Oil Co.	....	.....	5,400	6	5⅝	5¾	+ ¼
15½	4¾	7⅞	4⅝	413,333	N.P.	General Asphalt Co.	....	June 15, 32	300	5⅞	5⅝	5⅝	0
28¼	8¾	15¾	8¼	95,841	$100	Houston Oil Co.	....	.....	800	11½	10¾	10¾	— 1¼
5⅜	1⅝	3¼	1⅞	678,234	25	do new.	....	.....	.....	.....	.....	.....	.....
2¾	1	2	1¼	1,207,082	10	Indian Refining Co.	....	Dec. 15, 20	.....	.....	.....	.....	.....
2¼	½	1	⅝	1,309,060	N.P.	Louisiana Oil Ref'g. Corp.	....	.....	100	¾	¾	¾	0
18	3	4	3½	40,000	$100	do pfd.	....	May 16, 32	.....	.....	.....	.....	.....
1½	⅜	¾	½	330,000	N.P.	Maracaibo Oil Exploration Co.	....	.....	.....	.....	.....	.....	.....
65	50	...	...	449,083	$100	Mexican Petroleum Co.	....	Apr. 20, 31	.....	.....	.....	.....	.....
8⅞	3¾	5⅜	3¾	1,857,912	N.P.	Mid-Continent Petroleum Corp.	....	Feb. 16, 31	2,700	4⅝	4⅜	4½	+ ⅛
11	5	7⅛	4¾	6,548,052	N.P.	Ohio Oil Co.	....	Dec. 15, 32	6,100	5⅞	5½	5½	0
14	6	12½	12	1,000,000	$5	Pan American Pet. & Transp. Co.	20cQ	Mar. 15, 33	.....	.....	.....	.....	.....
14½	7¼	12½	11½	2,474,886	5	do B non-voting.	20cQ	Mar. 15, 33	.....	.....	.....	.....	.....
1¼	¼	1⅛	½	199,370	N.P.	Panhandle Prod. & Ref'g. Co.	....	.....	100	⅝	⅝	⅝	— ⅜
14	3½	6½	5¾	25,666	$100	do pfd.	....	July 2, 23	.....	.....	.....	.....	.....
7⅜	3	6⅜	4⅝	2,236,944	N.P.	Petroleum Corp. of America.	....	June 1, 31	2,700	5⅜	5⅛	5¼	— ⅛
8⅛	2	6½	4¾	4,433,801	N.P.	Phillips Petroleum Co.	....	Jan. 2, 31	375,200	5⅞	5½	5⅝	— ⅛
¾	¼	⅜	¼	1,184,817	$25	Pierce Oil Corp.	....	.....	600	⅜	¼	¼	0
9	3½	5¼	3⅞	150,000	100	do pfd.	....	Feb. 1, 22	100	4¼	4¼	4¼	— ⅞
1⅝	½	1	⅝	2,500,000	N.P.	Pierce Petroleum Corp.	....	Feb. 16, 31	100	¾	¾	¾	0
12½	8½	9½	6¾	1,050,000	$5	Plymouth Oil.	25cQ	Dec. 30, 32	1,500	8	7	7¼	0
9½	3½	6	5⅜	2,441,432	25	Prairie Oil & Gas Co.	....	Mar. 31, 31	.....	.....	.....	.....	.....
12¼	5½	8⅛	7	4,050,000	25	Prairie Pipe Line Co.	....	July 1, 31	100	7¼	7¼	7¼	+ ⅛
1⅝	⅛	⅜	¼	749,017	50	Producers & Refiners Corp.	....	Sept.15, 23	.....	.....	.....	.....	.....
9¾	1	5	3	28,310	50	do pfd.	....	May 4, 25	.....	.....	.....	.....	.....
6½	2⅞	3⅞	2½	2,038,370	N.P.	Pure Oil Co.	....	Sept. 1, 30	5,100	3¼	3	3	0
80	50	62	30	180,000	$100	do 8% pfd.	50cQ	Apr. 1, 33	270	31¼	30¼	31	+ ½
1⅜	¼	½	¼	2,126,250	N.P.	Richfield Oil Co. (California).	....	Sept. 1, 30	600	⅜	¼	¼	— ¼
23¾	12⅛	21⅝	17⅝	433,814	$13.40	Royal Dutch Co. (N. Y. shares).	80½c	Aug. 5, 32	900	18⅜	18	18⅛	— ½
20⅜	6⅝	20¼	15	1,244,383	N.P.	Seaboard Oil Co. of Del.	††10cQ	Mar. 15, 33	14,670	18⅜	17½	17¾	— ¼
16⅜	8	18	11¼	57,192	L2	Shell Transport & Trading Co.	53c	July 22, 32	.....	.....	.....	.....	.....
8¾	2½	5⅝	4	13,070,625	N.P.	Shell Union Oil Corp.	....	June 30, 30	7,400	4½	4	4¼	— ¼
65¼	18	44½	30	400,000	$100	do pfd.	....	July 1, 31	600	33	28½	33	+ 2
7½	3¼	6¼	4⅞	500,000	10	Simms Petroleum Co.	25cQ	Jan. 16, 33	600	5⅛	5⅛	5⅛	0
5¾	2½	3¾	3	1,000,000	25	Skelly Oil Co.	....	Dec. 15, 30	800	3¾	3½	3⅝	— ⅛
33½	12	27	22	120,000	100	do pfd.	....	May 1, 31	400	27	26	26	— ½
12¼	5¼	7⅞	6	31,693,086	25	Socony Vacuum Corp.	10cQ	Mar. 15, 33	19,400	6⅞	6⅛	6½	+ ⅛
100½	81	101	92½	764,925	100	S. O. Export Corp. pfd.	$2.50S.A.	Dec. 31, 32	600	97½	97	97	0
31⅞	15⅛	26	19½	13,102,900	N.P.	S. O. California.	50cQ	Mar. 15, 33	7,800	23	21⅝	22¼	— ⅞
16½	7	17⅝	13¾	320,000	$10	S. O. Kansas.	....	Mar. 16, 31	400	13¾	13½	13½	— ½
37⅜	19⅞	31⅜	22¾	25,740,965	25	S. O. New Jersey.	25cQ	Mar. 15, 33	15,100	26	25¼	25⅜	— ½
39⅞	24¾	37	35	1,590,406	N.P.	Sun Oil Co.	25cQ	Mar. 15, 33	.....	.....	.....	.....	.....
92	68	98	89	100,000	$100	do pfd.	$1.50Q	Mar. 1, 33	10	96½	96½	96½	+ 6½
2	¼	1⅞	¾	776,979	N.P.	Superior Oil Corp.	....	.....	1,400	1¼	1	1	— ⅜
18¼	9¼	14⅛	10¾	9,851,236	$25	The Texas Corp.	25cQ	Apr. 1, 33	7,800	12⅝	12	12	— ½
4	1½	1⅞	1⅜	930,507	10	Texas Pacific Coal & Oil Co.	....	Dec. 31, 29	900	1⅝	1½	1½	— ⅛
5⅝	2	4	3⅛	5,998,919	N.P.	Tide Water Associated Oil Co.	....	Feb. 16, 31	6,100	3¾	3⅝	3⅝	0
60	20	44⅛	27	695,503	$100	do pfd.	....	Jan. 3, 33	900	27¼	26	26	— 1⅛
10	5	...	...	2,191,954	N.P.	Tide Water Oil Co.	....	Dec. 31, 32	.....	.....	.....	.....	.....
62	30	50	45	199,446	$100	do pfd.	$1.25Q	Feb. 15, 33	200	47	47	47	— 1¾
15⅜	8	11⅝	8½	4,386,070	25	Union Oil Co. California.	25cQ	Feb. 10, 33	1,400	10¾	10	10¼	— ¼
19¼	11¾	12½	10½	1,254,048	N.P.	Union Tank Car Co.	35cQ	Mar. 1, 33	300	12	11⅛	11⅛	— ⅞
2¼	½	1½	⅝	769,531	N.P.	Warner Quinlan Co.	....	July 3, 30	.....	.....	.....	.....	.....
8¼	2¾	3	2	431,427	N.P.	H. F. Wilcox Oil & Gas Co.	....	May 10, 33	300	2½	2½	2½	— ⅛

*New high. †New low. ††Also extra—Seaboard 10c.

Standard Oil Stocks on New York Curb Market

1932 High	1932 Low	1933 High	1933 Low	Shares Issued	Par Value	Company	Div. Rate Period	Last Div. Paid	Transactions Week Ended April 1 Sales Shares	High	Low	Last	Week's Change
7	6	6	6	40,000	$25	Borne Scrymser Co.	....	Oct. 15, 30	.....	.....	.....	.....	.....
35	17½	27	25	200,000	50	Buckeye Pipe Line Co.	75cQ	Mar. 15, 33	200	25½	25½	25½	+ ½
90	53	90	83½	120,000	25	Chesebrough Mfg. Co.	††$1Q	Mar. 31, 33	300	83½	75	75	—12
3⅛	1¾	2¾	2½	5,977,873	N.P.	Creole Petroleum Co.	....	.....	1,600	2½	2⅜	2⅜	— ⅛
35	18	28½	20	50,000	$100	Eureka Pipe Line Co.	$1Q	Feb. 1, 33	.....	.....	.....	.....	.....
55	35⅝	45	40	2,974,645	25	Humble Oil & Refg. Co.	50cQ	Apr. 1, 33	800	41¼	40½	40⅜	— ¼
10⅞	6¼	8¼	6½	26,742,792	N.P.	Imperial Oil Corp. coup.	12½cQ	Mar. 1, 33	2,100	6⅞	6⅝	6⅝	— ⅛
10⅛	6½	7⅝	6⅝	.....	N.P.	do registered.	12½cQ	Mar. 1, 33	200	6½	6½	6½	— ¼
7½	2¾	4	3⅛	300,000	$10	Indiana Pipe Line Co.	††10c S.A.	Nov. 15, 32	100	3⅜	3⅜	3⅜	+ ¼
12¼	8	10⅞	8⅞	14,247,088	N.P.	International Petroleum Co.	25cQ	Mar. 15, 33	4,300	9⅜	9⅛	9⅛	— ¼
10½	6	7⅝	5¾	509,000	$12.50	National Transit Co.	....	Dec. 15, 32	.....	.....	.....	.....	.....
6	2¼	3¾	3	100,000	5	New York Transit Co.	††20c S.A.	Oct. 15, 32	.....	.....	.....	.....	.....
5½	3⅛	5⅞	5	120,000	10	Northern Pipe Line Co.	25cS.A.	Jan. 2, 33	.....	.....	.....	.....	.....
79	60	76	70½	580,749	100	Ohio Oil Co. pfd.	$1.50Q	Mar. 15, 33	.....	.....	.....	.....	.....
10	1⅜	2	1¼	400,000	25	Penn Mex. Fuel Co.	50c	May 25, 32	.....	.....	.....	.....	.....
10	3¾	3½	3	100,000	10	Southern Pipe Line Co.	10cQ	Mar. 1, 33	.....	.....	.....	.....	.....
16½	9⅜	12	11	1,200,000	25	South Penn Oil Co.	25cQ	Mar. 31, 33	200	11¾	11⅛	11½	— ¼
37	27	33	24½	35,000	50	South West Pa. Pipe Lines.	$1Q	Apr. 1, 33	.....	.....	.....	.....	.....
25⅛	13⅛	22⅛	17	16,908,543	25	S. O. Indiana.	25cQ	Mar. 15, 33	7,300	19⅛	18¾	19	+ ⅛
15⅞	8⅞	11⅝	8⅜	2,606,983	10	S. O. Kentucky.	30cQ	Dec. 31, 32	3,800	10⅛	9½	9⅝	— ½
19	10¼	12½	12½	190,822	25	S. O. Nebraska.	25cQ	Mar. 20, 33	100	12	12	12	— ½
30⅛	15½	21	15½	752,465	25	S. O. Ohio.		Jan. 3, 33	500	17	15½	16	— ¼
87	75	85	72	120,000	100	do 5% pfd.	$1.25Q	Jan. 16, 33	20	72	72	72	— 3
2	1⅝	1⅛	1	34,158	25	Swan Finch Oil Corp.	....	Jan. 15, 32	.....	.....	.....	.....	.....

*New high. †New low. ††Also extra—Chesebrough 50c. N. Y. Transit 10c. Indiana P. L. 5c.

Seek to Dissolve Atlantic

PHILADELPHIA, April 1.—Special meeting of Atlantic Lobos Co. will be held April 26 to vote on dissolution of the company, which no longer is an active operator. Its assets consist of investments.

Ties Ad Up With Roosevelt's Creed

CHICAGO.—The infectious courage and optimism of President Roosevelt has seeped into current advertising of the Calumet Refining Co., refiner of Burnham "tested" pale oils here. Its latest bulletin bears the appropriate title of "A Business Man's Creed of Progress" underneath a large reproduction of the President at his desk. In it the company talks in first person as to what it believes in doing to overcome "hard times."

Oil and Royalty Stocks on New York Curb

1932 High	1932 Low	1933 High	1933 Low	Par Value	Company	Transactions Week Ended April 1 Sales Shares	High	Low	Last	Week's Change
3/4	1/4	3/8	1/4	N.P.	American Maracaibo..	4,400	1/4	1/16	1/16	— 1/16
3 3/4	3/4	1 7/8	1 1/8	N.P.	Arkansas Nat. Gas....	100	1 3/8	1 3/8	1 3/8	— 1/8
3 3/8	1/2	2	1	N.P.	do A.....	2,100	1 1/2	1 1/4	1 1/4	— 1/8
5 5/8	1 1/2	3 1/4	2	$10	do pfd.....	700	2 1/2	2 1/8	2 1/2	0
1/4	1/4	..	..	N.P.	Atlantic Lobos.....	.....	....	....	....	....
7/8	1/2	7/8	3/4	$50	do pfd.....	400	7/8	7/8	7/8	+ 1/8
9 3/4	6 3/4	7 3/8	6 1/8	N.P.	British Amer. Oil coup..	100	16 1/8	16 1/8	16 1/8	0
3/4	1/4	3/8	1/4	$1/4	Carib Syndicate.....	2,200	3/8	3/8	3/8	+ 1/8
6 7/8	1 1/4	3 1/2	2	N.P.	Cities Service.....	29,800	2 1/2	2 1/8	2 1/4	— 3/8
53 3/8	10	17 1/2	10 1/2	$100	do pfd.....	500	12 1/2	11 1/2	11 1/2	— 1 1/2
4 1/2	1	1 1/2	1 1/8	10	do pref. B.....	50	11	11	11	— 1
45	9	13	7 1/4	100	do pref. BB.....	.....	....	....	....	....
1 1/4	1/4	1/2	1/4	N.P.	Colon Oil Corp.....	700	1/4	1/4	1/4	0
2 3/8	1/2	1 1/4	3/4	N.P.	Columbia Oil & Gas vtc.	300	7/8	7/8	7/8	0
		1 1/4	1	$1	Consolidated Royalty..	.....	....	....	....	....
2 7/8	1/4	2 1/2	1 1/8	N.P.	Cosden Oil.....	800	2 3/8	2	2	— 1/4
8	1 7/8	5 1/4	3	$100	do pfd.....	100	7 7/8	7 7/8	7 7/8	+ 5 1/8
5/8	1/8	3/4	3/8	N.P.	Crown Central Pet....	600	5/8	5/8	5/8	+ 1/8
7 1/8	1 5/8	3 1/8	2 1/8	N.P.	Darby Petroleum.....	.....	....	....	....	....
3	1	1 1/4	7/8	N.P.	Derby Oil & Refg.....	.....	....	....	....	....
24 1/2	10 1/2	..	..	N.P.	do pfd.....	.....	....	....	....	....
44 3/4	23	31	24	$25	Gulf Oil Corp.....	1,800	28 1/2	27 1/4	27 3/4	— 3/4
5	3/4	1 1/2	1 1/2	N.P.	Indian Ter. Illg. Oil A	.....	....	....	....	....
4 1/2	1 1/2	1 1/2	1 1/4	N.P.	do B.....	.....	....	....	....	....
1/4	1/16	1/8	1/16	$5	Intercontinental Pet...	1,000	1/16	1/16	1/16	0
1	3/8	1	3/8	N.P.	Kirby Petroleum.....	100	1	1	1	0
3/4	1/8	3/16	1/16	$25	Leonard Oil Dev.....	.....	....	....	....	....
3 1/2	7/8	2 1/4	1 1/2	N.P.	Lion Oil Refg.....	300	1 1/2	1 1/2	1 1/2	0
11	3 3/8	7 3/8	5	N.P.	Lone Star Gas.....	500	6	5 1/8	5 1/8	— 7/8
1/4	1/16	..	..	$1	Magdalena Syndicate..	.....	....	....	....	....
8	3 3/4	6 1/2	4	N.P.	Margay Oil Co.....	.....	....	....	....	....
3 3/8	1 1/2	2	2	N.P.	Mexico-Ohio Oil.....	.....	....	....	....	....
2	1/2	1 1/2	1	N.P.	Michigan Gas & Oil....	.....	....	....	....	....
1 1/2	1/2	7/8	5/8	N.P.	Mid. States Pet. A vtc.	.....	....	....	....	....
5/8	1/4	1/4	1/4	N.P.	do B vtc.....	200	1/4	1/4	1/4	0
5/8	1/4	1/4	1/4	$1	Mountain & Gulf.....	100	1/4	1/4	1/4	0
4 3/4	2 1/8	3 3/8	2 1/2	10	Mountain Producers...	200	2 7/8	2 3/4	2 3/4	— 1/4
14 5/8	8	13 1/4	10	N.P.	National Fuel Gas.....	100	11 1/4	11 1/4	11 1/4	— 1/2
7/8	3/8	7/8	1/2	$5	New Bradford Oil.....	.....	....	....	....	....
1 1/2	5/8	3/4	5/8	N.P.	North Central Texas..	200	5/8	5/8	5/8	0
3/8	1/16	3/8	1/16	N.P.	North European.....	.....	....	....	....	....
5	2	3 7/8	3	N.P.	Oil Stocks Ltd. A.....	1,700	3 3/4	3 1/2	3 1/2	— 3/8
8	3	3	3	N.P.	Pacific Western.....	.....	....	....	....	....
3/8	1/16	3/16	1/16	N.P.	Pantepec of Venezuela.	100	1/8	1/8	1/8	0
5/8	1/16	..	..	N.P.	Producers Royalty....	.....	....	....	....	....
60 3/4	40	40 1/2	35	$100	Pure Oil 8% pfd.....	.....	....	....	....	....
1	1/2	7/8	3/4	N.P.	Red Bank Oil.....	.....	....	....	....	....
1/2	1/16	..	..	N.P.	Reiter-Foster Oil.....	.....	....	....	....	....
1	1/8	1/4	1/4	$25	Richfield Oil pfd.....	.....	....	....	....	....
1 1/2	1/2	4 1/4	3	N.P.	Root Refining pfd....	.....	....	....	....	....
1/2	1/2	..	..	$10	Royalty Corp. pfd.....	.....	....	....	....	....
2 1/8	5/8	1	5/8	N.P.	Ryan Consolidated....	.....	....	....	....	....
7/8	3/8	1/2	3/8	$10	Salt Creek Consol.....	900	3/8	3/8	3/8	0
5 1/2	2 7/8	4 1/2	3 1/2	10	Salt Creek Prod.....	1,000	4	3 3/4	3 3/4	— 3/8
..	..	5/8	5/8	25	Shrev. El Dorado P.L.	.....	....	....	....	....
5	2 7/8	4	3 1/4	N.P.	Southland Royalty....	100	3 3/4	3 3/4	3 3/4	— 1/8
5/8	1/4	3/8	1/4	$5	Sunray Oil.....	50	5/16	5/16	5/16	0
10 1/2	4 1/2	8	6 5/8	N.P.	Texon Oil & Land.....	200	6 3/4	6 3/4	6 3/4	— 1/4
1/4	1/8	1/4	1/8	$5	Venezuela Petroleum..	500	3/4	3/4	3/4	0
2 3/8	1 1/8	2 1/8	1 1/2	1	Woodley Petroleum...	300	1 3/4	1 3/4	1 3/4	+ 1/4
1 3/8	1/2	3/4	1/2	N.P.	Y Oil & Gas.....	.....	....	....	....	....

•New high. †New low.

Pittsburgh Stock Exchange

Transactions Week Ended March 31, 1933

	Sales	High	Low	Last	Change Over Week
Ark. Nat. Gas....	120	1 1/2	1 3/8	1 3/8	— 1/8
do pfd.....	141	2 5/8	2 1/2	2 5/8	+ 1/8
†Col. Gas & Elec..	1,192	11	10	10	— 3/4
‡Gulf Oil of Pa...	100	28	28	28	0
†Lone Star Gas...	3,303	6	5	5 1/2	— 1/2
‡ do 6. p.c. conv. pfd.	124	68 1/2	66	66	—4
‡Standard Oil of N. J.....	194	25 7/8	25 1/4	25 1/4	—1 1/8
West. Pub. Serv...	462	5	4 7/8	4 7/8	— 1/8

†Payable in new preferred stock; ‡Unlisted.

New York Curb Bonds

Week Ending April 1

	High	Low	Last	Change
Cities Serv. 5s '50.....	28 3/4	25 1/8	26 1/8	—2 7/8
Cities Serv. 5s '66.....	28	24 1/2	25 1/4	—3 3/4
Cities Serv. G. 5 1/2s '42..	49 3/8	44 5/8	45	—4 1/2
Cities Serv. G. P. 6s '43.	58 1/4	56 1/2	58	—1
Cont. Oil 5 1/4s '37.....	94 1/2	94	94	— 1/2
Empire O. & R. 5 1/2s '42.	34 1/2	29 1/4	30	—3 1/2
Gulf Oil 5s '37.....	96	95 1/2	95 1/2	+1
Gulf Oil 5s '47.....	95	95	95	—1
Sun Oil 5 1/2s '39.....	102 1/4	101	101	— 1/2
Tide Water 5s '79.....	53 1/2	50	50	—3 1/2

New York Bonds

Week Ending April 1

	High	Low	Last	Change
Asso. Oil Gold 6s.....	102 3/4	102 3/4	102 3/4	— 1/2
Atlantic Refg. deb. 5s...	100	98	98 3/8	+ 3/8
Cal. Pet. 5 1/2s.....	85	84 7/8	85	0
General Pet. 5s.....	103	102 1/2	103	+ 1/8
Humble Oil & Refg. 5s..	102 3/4	102	102	—1
Pan Amer. Pet. of Calif. 6s	32 7/8	27 1/2	31	+3 1/2
Pan Amer. Pet. of Calif. 6s ctfs.....	32	32	32	+7
Phillips Pet. 5 1/4s.....	72	67 1/8	69	—3 1/2
Pure Oil 5 1/2s.....	70	70	70	0
Pure Oil 5 1/2s.....	68	66	67	+1
Richfield Oil of Calif. 6s..	23 1/4	21 1/2	23	— 1/2
Richfield Oil of Calif. 6s ctfs.....	22	21 1/2	21 1/2	+ 1/2
Shell Union Oil 5s.....	70	68 1/2	68 1/2	+ 7/8
Shell Union Oil 5s w.w...	70 1/2	70	70	+1 3/4
Sinclair Con. Oil 7s.....	96 1/4	95 1/2	96 1/4	+ 1/4
Sinclair Con. Oil 6 1/2s...	93 3/4	92 7/8	93	0
Sinclair Pipeline 5s.....	101 1/2	100	100	—1 1/8
Skelly Oil 5 1/2s.....	63 1/4	62 3/4	62 3/4	—1 1/4
S. O. N. J. 5s.....	103 3/4	103	103	— 5/8
S. O. N. Y. 4 1/2s.....	95 7/8	93 1/4	93 1/2	—1 5/8
Union Oil of Calif. 6s A..	102 1/4	102	102 1/4	—2 1/4
Union Oil of Calif. 5s C..	99 1/2	99	99 1/2	+ 3/8
Union Oil of Calif. 5s w.w.	79	78	78	—1 1/4
Warner-Quinlan 6s.....	17 1/2	14	14	—3 3/4

Taxman Son Dies

CHICAGO, April 1.—Ethan M. Taxman, 7 year old son of Phil. H. Taxman of the Atlas Petroleum Co., Chicago, died March 28 at the Michael Reese Hospital.

ADVERTISERS IN THIS ISSUE

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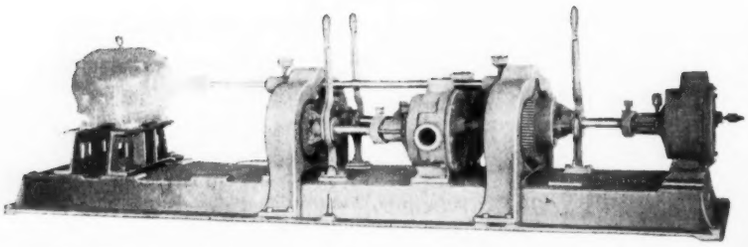


VIKING Pumps

ARE JUST AS BIG AS THE JOB THEY ARE TO DO

Viking Standard Rotary Pumps range in capacity from 5 to 1,050 GPM. The "Twins" offer capacities from 50 up to 750 GPM per pump. The Viking "Multiples" with a pump capacity of 90 GPM are available in series of 3, 4, 5 and 6 pumps. Viking "STRAITLINES" . . the last word in single pumping units have capacities of 10 to 450 GPM.

From the smallest cross-roads bulk plant to the largest refinery and blending plant there is a Viking Rotary Pump in the right capacity and style to do the job economically . . with less power requirements . . with remarkable freedom from repair and service expense . . over a long period of time. No job is to large or too small for the Viking. Write today for **FREE** Folder VS:402:32.

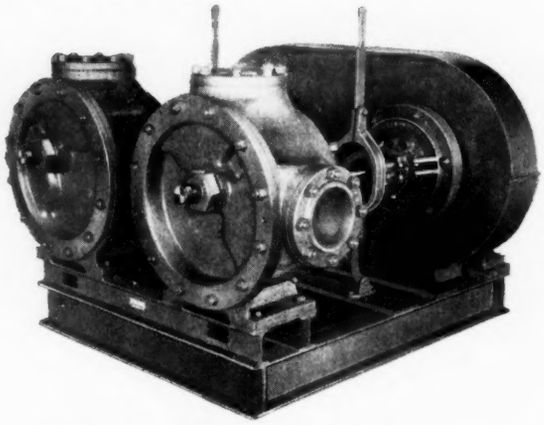
Viking Pump Company

CEDAR FALLS, IOWA

CHICAGO, Ill., 549 W. Washington St.; CLEVELAND, O., Marshall Bldg., 11 Public Square; DETROIT, MICH., Hamilton Ave. & W. Grand Blvd.; LOUISVILLE, KY., 561 Eastern Parkway; LOS ANGELES, CALIF., 2036 So. Santa Fe Ave.; MILWAUKEE, WISC., 2310 West Vliet Street; MINNEAPOLIS, MINN., 5134 Lyndale Ave., So.; NEW YORK, N. Y., 342 Madison Avenue; TULSA, OKLA., 1424 So. Boston Avenue.

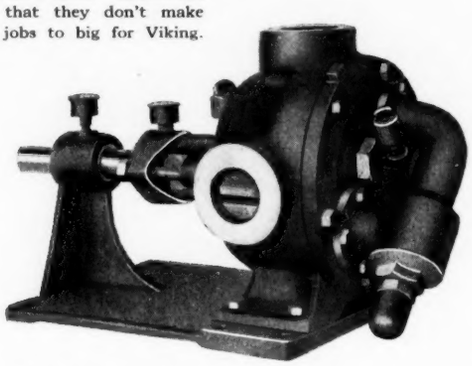
Viking "Multiple" Pumps

In multiples of 3, 4, 5 and 6 pumps. Permit the handling of as high as 6 grades of gasoline and oil at one time. Capacity of 90 GPM per pump.



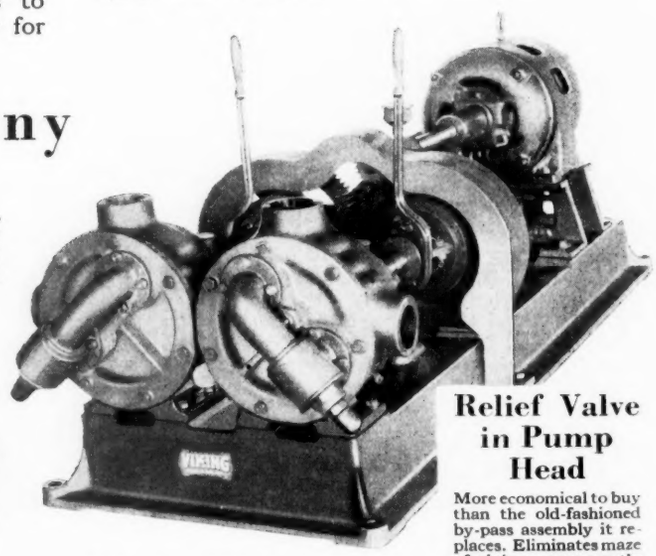
Viking "Giant" Twins

A mammoth 6" twin outfit with a capacity of 750 GPM per pump, powered with a 35 H.P. gasoline engine. This "Giant" installation is proof that they don't make pumping jobs to big for Viking.



Truck Mounting Pumps

Relief Valve on Pump Head. Capacities 20, 35, 50 and 90 GPM. Compact . . substantial. Driven by conventional power-take-off units. Sturdy, rugged pumps for all truck service.

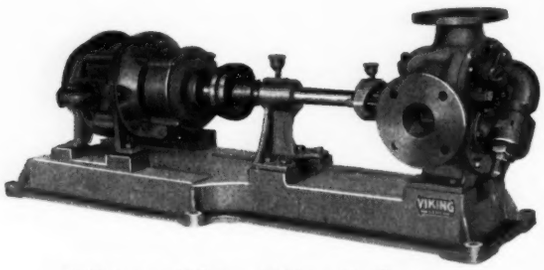


Viking "Twins"

Capacities from 50 to 750 GPM. per pump. Motor or gas engine drive. Regular or fire wall bases. Equipped with Relief Valves at slight additional cost.

Relief Valve in Pump Head

More economical to buy than the old-fashioned by-pass assembly it replaces. Eliminates maze of piping, consequently reduces chances for leaks, air pockets, etc. Serves as watchman against clogged lines, suddenly closed valves etc. Protects your pumping investment. May be quickly installed on your present Viking Pumps.



Viking "Straitline" Pumps

Narrow, compact bases save space. Single and double gear reductions permit speeds of less than 50 RPM. Capacities from 10 to 450 GPM. The last word in single pumping units.